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POLLUTION OF THE INTERSTATE WATERS OF THE POTOMAC RIVER (WASHINGTON METROPOLITAN AREA)-DISTRICT OF COLUMBIA-MARYLAND-VIRGINIA. PROCEEDINGS OF CONFERENCE HELD AT WASHINGTON, D. C. ON APRIL 2-4, MAY 8, 1969. VOLUME 3

Federal Water Pollution Control Administration
Washington, D. C.

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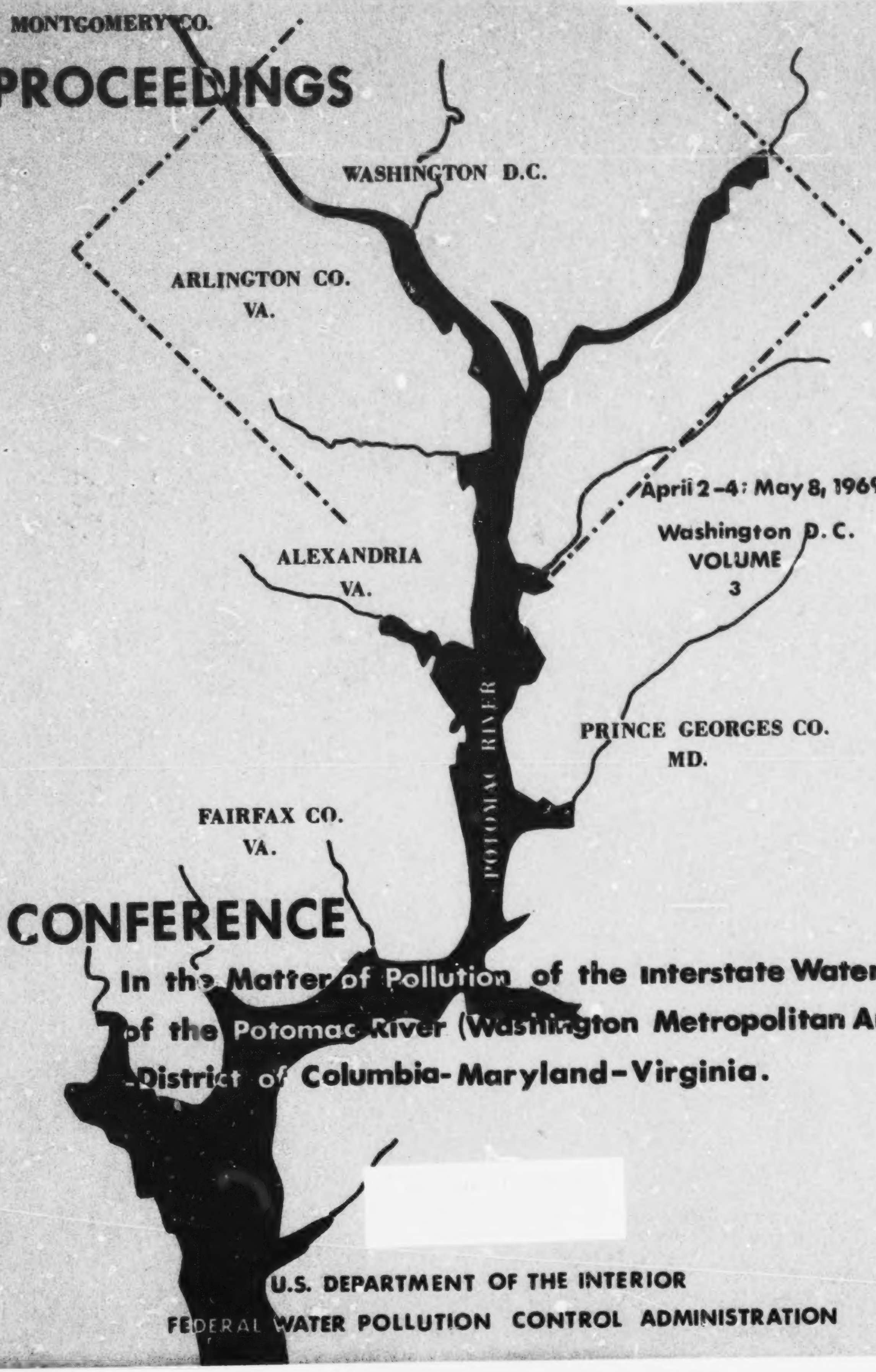
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April 2-4; May 8, 1969
Washington D.C.
VOLUME
3

CONFERENCE

In the Matter of Pollution of the Interstate Waters of the Potomac River (Washington Metropolitan Area) District of Columbia-Maryland-Virginia.

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

300

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APRIL 4, 1969

9:20 A.M.

SECRETARY KLEIN: Good morning.

I should have called this for 9:30 at that, I guess, because that is what it looks like this morning--not quite, but it is getting there.

We have this morning as the major item the presentation of the State of Virginia, and for that I will ask Mr. Paessler to take over. Mr. Paessler.

MR. PAESSLER: Thank you, Mr. Chairman.

I am going to defer the presentation of the State Water Control Board's statement until after the Northern Virginia communities have had an opportunity to make their comments, and with the consent of the conference, we will thus proceed.

I would like to call first on the County of Fairfax, and I believe here today to give the presentation is Mr. Harry Hale of the County of Fairfax.

STATEMENT OF
MR. HARRY L. HALE
DIRECTOR OF PUBLIC WORKS
COUNTY OF FAIRFAX
FAIRFAX, VIRGINIA

MR. HALE: Mr. Chairman, conferees, ladies and gentlemen:

The statement that I am about to read to you today was prepared by the County Consulting Engineers and submitted to the County Board of Supervisors for their review, and I am authorized to read this statement on behalf of the Board of Supervisors. Some of it you will find a bit repetitive because it is a report by the consultants.

RECOMMENDATIONS OF REPORT

The recommendations of principal concern to Fairfax County contained in the Potomac River Water Quality Report of the Federal Water Pollution Control Administration are as follows:

1. Waste treatment facilities be provided and maintained to ensure:

(a) 98% reduction in raw sewage fecal coliform densities.

(b) 96% reduction in five-day BOD (with a maximum total discharge of all jurisdictions combined of 16,500 lbs/day)

(c) 96% reduction in total phosphorous (P) from all sources.

The foregoing requirements are necessary, according to the Report, to meet the water quality standards for the Potomac at present waste loads and discharge locations.

The Report recognizes that these removals are extremely high by recommending that an evaluation be made of the feasibility of discharging effluent from the District of Columbia Water Pollution Control Plant through several outlets along the estuary rather than through the existing single outfall. According to the Report, water quality advantages of multiple outlets in the case of the District plant should be assessed because this may indicate that reductions are possible in the extremely high removal percentages that are otherwise necessary.

Compared to the above requirements, the Federal Enforcement Conference, in 1957-58, on pollution of interstate waters of the Potomac River in the Washington Metropolitan Area recommended that the District of Columbia and the Virgnia communities of Alexandria, Arlington and Fairfax accomplish disinfection of sewage when necessary and 80% reduction of BOD in sewage reaching the treatment plants.

COUNTY TREATMENT PLANT STATUS

At present no County plant includes facilities for phosphorus removal. Each County plant does include disinfection facilities for reduction of coliform densities the efficiency of which is somewhat related to degree of removal of suspended matter and biochemical oxygen demand. As for removal of biochemical oxygen demand from County sewage, the data are as follows:

Lower Potomac Plant--

Completion--late 1969. Initial capacity--17 mgd. Initial flow 8.0 mgd. Expected to remove 90-95% BOD with annual average of at least 90%. This is the maximum removal usually attainable by the best secondary treatment methods as here employed.

Little Hunting Creek Plant--

Completion of enlargement and improvement in treatment--late 1970. Initial enlarged capacity 5.4 mgd. Initial flow--3.5 mgd. Expected BOD removal--same as Lower Potomac Plant.

Dogue Creek Plant--

Present flow--1.7 mgd. BOD removal--80%. Scheduled for enlargement and increased BOD removal in 1970-1972.

Westgate Plant--

Present flow--10.0 mgd. BOD removal--50%. This is County's oldest plant; constructed 1951-1952. Studies for improving treatment and capacity additions nearing completion. Various alternates under consideration including discontinuance of this plant by diversion of flow to the Alexandria Sanitation Authority plant.

TREATMENT SERVICE BY NEIGHBORING JURISDICTIONS

In addition to the foregoing plants, County sewage is also treated at the Pollution Control Plants of neighboring jurisdictions as follows:

District of Columbia--This plant currently receives 3.9 mgd of County sewage and provides about 71% BOD removal.

Alexandria Sanitation Authority--This plant currently receives 9.8 mgd of County sewage and provides about 76% BOD removal.

Arlington County--This plant currently receives 1.5 mgd of County sewage and provides about 90% BOD removal.

EVALUATION OF RECOMMENDATIONS

(1) With respect to "98% reduction in raw sewage fecal coliform densities":

This requirement can be achieved at existing County plants and those under construction by use of equipment already installed or in the process of installation.

(2) With respect to "96% reduction in BOD" (including the limitation that the maximum total discharged of all jurisdictions combined not exceed 16,500 lbs/day)

As recognized in the report, 96% reduction in BOD is extremely high. This removal, it is assumed, is an average. Therefore, facilities must be capable of removing more than 96% much of the time. The best present methods and those for which County facilities are under construction or contemplated may be expected to operate at their best in the 90-95% range with an annual average value of at least 90%. To increase this value to 96%, which is another way of saying that we must remove 60% of the residual BOD in the effluent of these plants, will require supplemental treatment.

The procedures to employ for this purpose should and can also take into account the next and last requirement, namely phosphorous removal. The further limitation that all jurisdictions combined shall not discharge in excess of 16,500 lbs/day of BOD involves also the question of elimination or treatment of combined sewer overflows during storms. This occurs in several of the jurisdictions, but not in the County of Fairfax.

(3) With respect to "96% reduction in total phosphorous (P) from all sources":

The objective of this requirement according to the Report, is to prevent algal growths in the Potomac estuary. It is noted that this requirement shall apply to "all sources". Presumably this would include land runoff as well as sewage and industrial wastes. We assume the County's obligation in this respect would be limited to reduction in phosphorous in sewage and wastes reaching its treatment plants.

The desirability of controlling algal growths is now generally acknowledged. Unfortunately developing control programs is hampered by the problem's complexity and by the lack of adequate information on the effectiveness of possible control measures. Under these conditions, some authorities take the position that any control measure with a change of improving the situation should be imposed. Others insist that more research should be undertaken to provide some of the important information now lacking; otherwise, the enforced controls are apt to be unnecessarily costly, ineffective, or both. In short, we aren't really sure whether removing phosphorous and removing it to the extent of 96% is the right thing to do or not.

Nevertheless, with present technology, phosphorous can be removed from municipal wastewaters according to demonstrations of the Federal Water Pollution Control Administration. Thus, by the use of chemical treatment processes following conventional activated sludge treatment (which will soon be available in all the County plants) their data show that such treatment removes 90-95% of the total phosphorous present in municipal wastewater. To reliably obtain 96% phosphorous removal, chemical precipitation treatment would probably be followed by sand filtration. Whether this will or will not solve the algae problem remains a reasonable question. What is very important in connection with the Potomac River standards, however, is that such treatment for removal of phosphorus also results in reductions in turbidity, biological oxygen demand, chemical oxygen demand and bacterial counts. Thus, the addition of chemical treatment to those plants of the County providing activated sludge treatment should make it possible to attain the higher BOD removals and reductions in fecal coliform densities set forth in the recommendations of the Potomac River Report.

COSTS

Cost data largely based on FWPCA sources and as published elsewhere but with allowances for local conditions indicate that the expected cost of phosphate removal (including capital amortization) by add-on chemical treatment facilities (without filtration) to an activated sludge plant may be in the order of $60 to $70 per million gallons of sewage treated. Should the District undertake construction of multiple outlets and should this procedure prove effective, then the extent of phosphate removal by chemical treatment (90-95%) may be sufficient. On an annual basis, therefore, at present wastewater flows, costs would increase by $750,000 which is 15% of the fiscal 1969 budget covering fixed charges on borrowed capital and operation and maintenance expenses of all County integrated sewerage facilities.

On the other hand, if multiple outlets are not constructed by the District, or, if constructed, the expected improvements are not realized, then to assure on an average, 96% reduction in phosphorous, the add-on chemical treatment must be followed by sand filtration. Under these conditions, the cost of phosphorous removal may be expected to be in the order of $120 per million gallons in lieu of $60 to $70. At present wastewater flows, County costs would increase by $1,400,000 annually, which is 21.5% of the fiscal 1969 sewerage budget. Costs in the future for phosphorous removal would increase about in proportion to population increase. These costs are exclusive of the added costs to increase capacity and provide secondary treatment at Westgate (or in the alternative to jointly enlarge and improve the Alexandria plant) or the cost of enlarging and upgrading the Dogue Creek Plant. To the extent that treatment for phosphorus removal may be provided at Alexandria, Arlington, and the District of Columbia, the increase in the County's annual cost reflects the additional costs for phosphorous removal provided by these jurisdictions for County sewage. Additionally, however, the County will be required to participate in substantial expenditures by these jurisdictions to improve their basic treatment.

CONCLUSION

It is clear that expenditures confronting the County and other jurisdictions in the Metropolitan area in meeting the proposed quality standards will involve substantial, continuing, and increasing expenditures. Accordingly, the position of the Council of Governments that studies of the Potomac estuary recommended by its panel of scientists be enlarged and intensified to assure that these substantial expenditures will succeed in correcting the pollution problem is sound and should be supported.

SECRETARY KLEIN: Do I have any questions of Mr. Hale from the conferees on my left?

MR.HOPE: It is a good statement.

SECRETARY KLEIN: Any questions on my right?

MR. JENSEN: Mr.Hale, what would this cost figure be in terms of a service charge to a consumer family in your town?

MR. HALE: You are referring to the million-dollar increase?

MR. JENSEN: Yes, sir.

MR. HALE: We are currently serving about 350,000 people. Let me see if I can figure that out here.

SECRETARY KLEIN: Mr. Murray Stein has a comment for you which is appropos at this time.

Mr. Stein.

MR. STEIN: Well, you know, I will be prepared to pay my share of that cost if you ever extend the sewer to my house.

SECRETARY KLEIN: I'm sorry to have dragged you off the other figuring. Let's get back to it.

MR. HALE: As I indicated, we are serving about 350,000 people, so the average family is about 3.7 people per family.

MR. JENSEN: What will Mr. Stein have to pay per month then for his sewer services when he gets it?

MR. HALE: Currently, it is $39 per year, sir.

MR. JENSEN: A little over about $3 per month then?

MR. HALE: Yes, sir.

MR. JENSEN: And how much do you estimate that will go up when you go to total nutrient removal, if you do go to total nutrient removal?

MR. HALE: With the figures we have here, we show up about 20 per cent.

I personally feel that these figures are perhaps a little bit low from some of the former information that we had presented here.

MR. JENSEN: So it will then cost our Mr. Stein perhaps $4, per month?

MR. HALE: We think that would be in order, yes.

MR. JENSEN: I don't know whether he can afford it.

MR. STEIN: Well, let me tell you, when you talk about $39 a year, with heating and air-conditioning, it almost costs me that a month for electricity.

SECRETARY KLEIN: $4 a month?

MR. STEIN: No, $40.

SECRETARY KLEIN: He is talking of $4 a month to you on sewage.

MR. STEIN: Yes.

SECRETARY KLEIN: And you are talking how much a month on electricity?

MR. STEIN: Over $30.

SECRETARY KLEIN: Over $30, so electricity is seven times as much.

You know, I got to thinking about this, and every one of the sanitary engineers who comes up here bemoans the fact that we have to put so much money into a plant.

If they were in industry and they were going to put in a new plant for electricity or gas or anything else, they would call it a capital investment for better production in the future. It just appears to me that we are using the wrong terms, that this is what we are doing here. We are doing the same thing that the public utilities do, and we had better change our terminology, because this is an investment in the future and it is a capital investment in the future, and it is not an expense to the taxpayers but is an investment for the taxpayers.

This is no criticism of you, because we are all in the same boat. We have been using the same terminology all the time. I just brought this up because that is one thing we keep hearing all the time.

We have now gotten it. It costs $4 a month for the best treatment in Fairfax County, and I am sure you taxpayers will be willing to pay it when you point out how much electricity and other things cost.

Let me go to your final statement, and here you raise the question of whether or not these standards are correct.

Have you any alternative in order to clean up the Potomac? This is the problem.

MR. HALE: My only suggestion, sir, would be this: That it was only two days ago the first time that I heard the statement made that to do what is called for in this report would actually accomplish the fact without any question. This statement was made in answer to a question of whether this would accomplish what we are out to do. This is the first affirmative reply that I have seen or heard to this effect.

Our consultants, in reviewing this up to this point, which was last week, had not had that information to convince them.

I think at this point it would be appropriate, speaking on behalf of Fairfax County, that our consultants would meet with the Federal Water Pollution Control Administration staff to discuss the facts in the report that have been released. I am now referring to the detailed information that has led to the conclusions in this report, and I think that we would then have a better understanding in detail of these conclusions. But up until last week our consultants were of this opinion that they did not have that information conclusively enough to allow them to recommend to us that this would solve the problem.

SECRETARY KLEIN: I think one of the things everybody is missing is that the Congress of the United States has passed the Federal Water Pollution Control Act, and in it they say: "The purpose of this Act is to enhance the quality and value of our water resources."

Now, you have talked about 1957-1958, setting 80% standards. Do you think, in the light of what has happened in the last ten years, that this 80% removal that has been put in all over the area has enhanced the quality of the Potomac during that period of time?

MR. HALE: I would say that it probably has not, sir because of the growth which has outstripped the progress that we have made.

SECRETARY KLEIN: You see, this is the proposition. When you draw from your knowledge of what you had and what you have now, there is only one answer you come out with, that it wasn't good enough in 1957-1958 and this is the technology we had, and we are all caught short.

No blame attaches to it. It is just that let's assess it and reevaluate it — 80 per cent was thought to be good enough, because that is all we knew about at that time. Today we know quite a bit more.

What are we getting at in the Federal Water Pollution Control Administration? We are getting at the proposition of trying to turn the water back in as good a quality as possible, as close to the quality as you picked it up as we know how, without going too darned far, and you and I know that still today the question of operating tertiary and operating removal of nitrates and phosphates is expensive.

But we can't stand around and wait. We have to go ahead.

This is what industry has been doing with everything they do. Every day we get a new product in steel or in nickel. Every day they keep experimenting with new drugs, and they all come out better as they go along. But they didn't stop just somewhere along the line and say, "We are not going to put out this product until after we find out that this will sell, or we may be able to find a better one." They put out the better product now, and they go on to a still better one and still better one, and this is what the thinking should be here among sanitary engineers.

We should get down to the point of putting out the best product we can. On the costs that are now coming up where you say $4 a month, I don't see where anybody in your county will object to it.

Let me ask you one more question: What kind of planning have you done for the future increase in your county? And it is obvious it is going to expand like mad.

MR. HALE: We have made some reference to it here, constantly increasing the capacity of the facility.

We are in the midst of a program at the moment for an entire new drainage plan, referred to as the Potomac watershed, putting in a complete system actually ahead of the development

Normally, we are not in a position to be out ahead, but in this we are in the process and we will have completed by next December a new treatment plant and some 29 miles of trunk sewers that will serve both the

Pohick and Oceoquan watershed. This plant is projected into the future to serve not only this area, but even to serve the tri-county area bordering on the Oceoquan Creek watershed.

This is the type of approach we are using. We are planning ahead. The population explosion has even changed criteria. For example, one plant that we had planned with a capacity of 3.7 million gallons per day is now projected to be 8 million gallons per day.

We have coming off the drawing boards now plans to completely scrap about half of that plant that is virtually new and going to activated sludge in order to utilize sites that we have available. We are constantly planning for expansions and are making these planned expansion.

SECRETARY KLEIN: Again, I would point out to you that I realize, having been a State legislator, the difficulties in getting the monies in advance. It is tough enough to get them afterward to meet these problems, but what we have to do is do some changing in our thinking.

Now we have to say, if we are going to have this many people, that we had better figure out that sometime in the future we are going to need this.

This is what electric companies and the other public utilities and everybody else does. They try to figure out what they are going to run into in the future and plan for it.

You and I know that we can't get this in taxes out of our present constituents and then at a later date they yell because we are caught short.

But I'm glad to hear that you are looking forward to the future and that you are trying to plan for it, even though you are stuck in the middle on something like that.

Thank you.

Are there any further questions or comments?

(No response)

SECRETARY KLEIN: Fine. Thank you very much, sir.

MR. PAESSLER: I would like at this time to call on the County of Arlington, and to make this presentation is Mr. F. H. Doe.

STATEMENT OF

MR. F. H. DOE, JR.

DIRECTOR OF UTILITIES

ARLINGTON COUNTY, VIRGINIA

MR. DOE: Mr. Chairman, conferees and ladies and gentlemen:

My name is F. H. Doe, Jr., and I am Director of Utilities for Arlington County.

I may sound like the record with the needle that sticks in the groove and goes around and around. For that I will apologize. Nevertheless, our position goes like this:

Arlington County built its original sewage treatment plant in 1937. It was a primary plant with a capacity of 5 million gallons average daily flow. In 1953, an enlarged plant, still with primary treatment, but with a capacity of 20 mgd, was placed in service.

In January 1968, secondary treatment facilities built at a cost of $5.5 million began operations. This plant, using the step aeration, activated sludge process, removes 90% of the biochemical oxygen demand and has a capacity of 24 mgd.

Arlington's future plans presently call for enlarging the plant to 30 mgd capacity about 1985, but still with 90% BOD removal.

The proposal being made at this conference to require 96% removal of BOD and phosphorous will radically change Arlington's future plans. Based on Dr. Stephan's figures, Arlington's present cost of $1.5 million per year for plant operation and debt amortization could increase by $1,000,000 per year in meeting the new standards.

Arlington citizens, in the past, have supported bond referendums for sewerage improvements and I believe they will do so again, but, as a responsible public official, I feel that we need more definite assurance that the much higher degree of removal of BOD and the new requirement for phosphorous removal will indeed result in a much cleaner Potomac before I can wholeheartedly recommend the expenditure of large sums of money.

The investigative work done by the FWPCA and others to date has provided excellent information, but I concur with the oft-repeated statement that the research program outlined by the John Hopkins Scientists in the November 15, 1965, report to the Council of Governments should be implemented in its entirety to gain a more thorough understanding of the complex physical, chemical and biological interactions in the Potomac estuary.

More specifically, one of the speakers on Tuesday stated that even if 96% phosphorous removal from treatment plant effluents were to be accomplished, there is enough phosphorous coming down the river to cause algal blooms.

Another study area requiring more attention is the effect of pollutants from urban storm water runoff. As the conferees know, the small amount of work done in this area indicates a heavy pollutional load for a short period of time at the beginning of a rain.

On a personal note, I was born and raised in Arlington. Forty years ago, my father and I would swim across the river above Key Bridge on a summer Saturday. I have hiked and camped the river shores as a Boy Scout. Did you know there used to be a sandy beach near Spout Run? Well, the point of all this, is to ask what the effect on the estuary would be if substantially all of the bottom deposits were to be removed. It would probably double the volume of the water in the estuary and possibly change this maximum loading figure of 16,500 pounds of BOD per day.

In conclusion, it seems to me that this conference should have been called for the entire Potomac

Basin so that the pollution abatement program could have included goals for the reduction of nutrients and silt from upstream in addition to the removal requirements for the Washington metropolitan area.

Thank you, Mr. Chairman.

SECRETARY KLEIN: Are there any comments or questions from the conferees on my left?

(No response)

SECRETARY KLEIN: On my right? Mr. Jensen.

MR. JENSEN: I did learn to swim in the Potomac River, by the way. I noticed that you used to swim in the Potomac, and I wondered if you found it enjoyable at that time.

MR. DOE: Yes, I found it quite enjoyable, Mr. Jensen.

MR. JENSEN: It was a convenient source of recreation to you then?

MR. DOE: It certainly was, and I wish it were today.

MR. JENSEN: Thank you.

SECRETARY KLEIN: Would you swim in it today?

MR. DOE: Definitely not.

SECRETARY KLEIN: Part of the reason is

what is coming in from Arlington, isn't it?

MR. DOE: I would certainly agree to that.

SECRETARY KLEIN: All right. Then, in other words, we are not returning the water back in a manner which would enhance the water quality of the Potomac; is that right?

We are getting back to the same action. This is what we are pledged to do as sanitary engineers and you in your position as a Government employee, to follow the law of the land.

MR. DOE: You have asked this leading question of several people.

SECRETARY KLEIN: Yes. I want to drive it home, and we have a job to do to clean up the Potomac, and we can't stop with what we have been doing now, because we have learned that all it does is make it worse because we are trapped in a population explosion, and scientific research has now shown us a way to do it better.

Let me ask one question. This does not seem to fit in with the rest of this. You said "If substantially all of the bottom deposits were to be removed." How are you going to remove them?

MR. DOE: Dredging.

SECRETARY KLEIN: Where are you going to put them? In Arlington County?

MR. DOE: No. This would be a problem for the Corps of Engineers, I would think.

SECRETARY KLEIN: I have just gotten finished telling the Corps of Engineers they can't put any of the dredgings into the Great Lakes.

You know what is on the bottom now. Where are you going to put them? Do you want to put them in Arlington County? And your answer, of course, is going to be "No", and Fairfax County is going to say "No". Nobody wants them. Where are you going to put them?

MR. DOE: I don't know the answer to that, but I think it is important to think about where we put the material.

SECRETARY KLEIN: I think if we are going to go to these higher treatments, it will slowly diminish and improve by itself.

MR. DOE: This could be true, but I don't believe we know that right now.

SECRETARY KLEIN: Are you willing to state that it will not?

MR. DOE: No. We don't have enough

scientific data to make that statement categorically.

SECRETARY KLEIN: Do you have any alternatives to the 96-98 per cent?

MR. DOE: No, I do not, and none of the sanitary people, I believe, take the position that this may not be necessary.

The position we are trying to state, and we are boxed in here, you realize, by serving our people on the one hand and attempting to answer your questions on the other, is that we want a little more assurance, if you will, that what you are asking us to do will in fact do what you think it will do, if you follow me.

SECRETARY KLEIN: Yes. You don't want to go back and ask for additional money from your taxpayers.

MR. DOE: I didn't say that.

SECRETARY KLEIN: Well, that is what it boils down to each and every time.

Let's go back to this monthly charge business. How much is your monthly charge to a family?

We just had an idea of about $3 per family over in Fairfax. Do you run about the same today?

MR. DOE: We bill water and sewer together on one bill. It runs probably 15 or $20 a quarter--

something of that sort--approximately the same as Fairfax.

SECRETARY KLEIN: How much, going into this type of treatment, tertiary with removal of nutrients, will you ask additional?

MR. DOE: Probably not over a 50 per cent increase, I would say, in the monthly service.

SECRETARY KLEIN: We just heard a statement from Fairfax that it would be about 20 per cent.

MR. DOE: Well, I think he is a little low.

SECRETARY KLEIN: How much low? Do you think you are high?

MR. DOE: I think I am closer to it. 40 to 50% would be my guess.

MR. JENSEN: Mr. Doe, could you give me an estimate of the cost of belonging to a private swimming club in your community?

MR. DOE: Not offhand. I don't belong to one. I don't know what the cost is.

MR. JENSEN: In my county it costs $4 a month, which happens to be a comparable figure to the one we are talking about.

SECRETARY KLEIN: We are getting at a proposition here, and I am going to keep coming back to it every time because I am running into a negative attitude on this.

If we keep doing it the way you are doing, we are going to keep on polluting the Potomac, are we not, and make it worse all the time?

MR. DOE: Well, again this is something of a leading question, but in essence I think you are right.

SECRETARY KLEIN: I think that the last ten years since we set this 80 per cent-90 per cent has proven that the Potomac just gets worse. Therefore, the answer is that we can't stand still. We have got to do something about it.

The positive statement was made, as Mr. Hale pointed out, that this will reduce the load on the Potomac, and if we get the 16,500 it will start cleaning up the Potomac. We have taken that as a premise. Now what happens to your speech this morning?

MR. DOE: We still have the problem of going to the people, and I know you won't like this--

SECRETARY KLEIN: No. I said that myself

yesterday and I said it today also.

MR. DOE: Yes. I mean you begin to get a little of the feeling of what we in this area have to put up with or cope with.

SECRETARY KLEIN: Sir, I was the writer and the main protagonist of a billion-dollar issue in Illinois last year, and I carried it 57 to 43 per cent.

MR. DOE: That's excellent.

SECRETARY KLEIN: I didn't win it, because I lost the constitutional majority in a certain technical area. It will go on next time, because we will put on paper ballots, but the people wanted it, $1 billion.

MR. DOE: Yes. Now, Mr. Stein may be willing to pay, but his taxes are also probably going up in Fairfax, and telephone is going up and the other utilities go up, and numbers of citizens get upset when you talk about raising rates.

SECRETARY KLEIN: One question: Which is more important?

You are on this end of it. Are you defending all of the other raises or are you defending your position as a pollution man that you want to reduce pollution?

Are you making excuses for the fact that you are polluting the river and you don't want to spend the money for it, or are you going to say that this is just as important as all of the other items, and we have to get at this problem now or it's going to cost ten times as much later?

MR. DOE: I agree that it is just as important.

There is no question in my mind, and I think the other sanitary men in the area are completely in agreement, that this is one of the most important items, and just as important--let's put it that way--as any other programs, be they education or what not.

SECRETARY KLEIN: I don't want to say anything about education because I will go with that, too, but if you don't have good water and a good Potomac, you are not going to have good education because the people will move away, although they may not move away from here because this is the Government. But it has been my experience that when you get polluted water, people move away from there and industry moves away.

As far as industries that do the polluting, we don't have that here. The Government has got to stay here. That does not mean that you have to pollute the waters also.

The answer, very frankly, gentlemen, is stop apologizing for the fact that you have to ask for some money to do a job on this, and say that it has to be done.

This is a pitch I will make to all of you gentlemen. You are all afraid to go out and tell them that this must be done if we are going to get the job done.

The Congress of the United States has said this, and I am sure the Congress is not going to back down on the question of enhancing the value of our water resources and the quality of the water.

Now, you have agreed with me, everyone who has been up here, that you have not enhanced the quality of the water since 1957-1958, and every one of you wants to beg the question about doing something about it. You can't beg the question. You are either going to have to do something about it or you personally will have to answer to the people as to why you did not do something about it.

MR. DOE: I should rebut, but I think it would be repetitious.

SECRETARY KLEIN: I know what the problem is in raising money, but I think that you are wrong. I think that the people are ready and willing to pay for it, and all you have to do is, instead of these astronomical figures, show them this is what it costs and we can start putting this river into shape.

The question is as to whether we will all do it. Everybody keeps raising the upstream part of it. We realize also that that has to be done. There are so many different factors on it, but 90 per cent of it is human sewage and it comes from this area.

Now, you can't beg away from your 90 per cent of this, and if you are going to grow over there, you are going to have to take care of your problems.

MR. DOE: I don't think anybody has said in my comparable position that we are afraid to go to the people and ask for more money. We feel that we need a little more reassurance that the expenditure of this large amount of money which it will take will in effect do the job.

SECRETARY KLEIN: Sir, this is your position. It is Arlington County. You are going to have to take a stand that either it is necessary or it is not necessary. You will have to take that stand. You can't beg the question, because it is going to be dumped right in your lap, and you are going to have to come up with the answers and not beg it.

I am not going to allow you to beg the question. You are going to have to say to your voters, "These are not necessary and I refuse to do it", or you say that "These are necessary and will help the proposition and we will have to do it."

Are there any further questions or comments?

(No response)

SECRETARY KLEIN: Thank you. Mr. Paessler.

MR. PAESSLER: I will call next on the city of Alexandria Sanitation Authority, and to make this presentation is Mr. Samuel Shafer of the Authority.

STATEMENT OF
MR. SAMUEL W. SHAFER
DIRECTOR
ALEXANDRIA SANITATION AUTHORITY
ALEXANDRIA, VIRGINIA

MR. SHAFER: Mr. Chairman and conferees:

S. W. Shafer

About a year ago we filed with the State Water Control Board a schedule of things that we would do to bring our treatment plant in Alexandria up to the necessary level required to maintain the water quality standards as they have been established. Our engineers have been working on preliminary studies based on what at the time we were led to believe was required, which was 90 per cent removal of BOD and some future nutrient removal facilities not clearly defined.

When the Federal Water Pollution Control Administration report came out about ten days ago, we then had to ask our engineers to take a look at this. "This is a new ballgame, and see what it means to Alexandria."

They have prepared a short report for us, and I would like to call Mr. Robert Hall of Greeley and Hansen, Consulting Engineers, of Chicago, Illinois, to read that report.

STATEMENT OF
MR. ROBERT L. HALL
ASSOCIATE
GREELEY AND HANSEN, CONSULTING ENGINEERS
FOR THE
ALEXANDRIA SANITATION AUTHORITY

MR. HALL: Mr. Chairman, gentlemen:

The Alexandria Sanitation Authority has for twelve years operated a trickling filter secondary treatment plant which has consistently removed 70 to 80 per cent of the five-day BOD. The plant design capacity of 18,000,000 gallons per day has been reached. Additions now under study, to be in operation by July 1, 1972, will provide double the present capacity, or 36 million gallons per day, with 90 per cent removal of BOD by the activated sludge process. These additions are estimated to cost in the neighborhood of $6,000,000, with a total annual cost of $1,500,000 or more compared with about $600,000 at present.

It is recognized that advanced treatment may be necessary in the future, if and when the needs therefor have been determined and the effectiveness and feasibility of various processes have been more conclusively demonstrated.

The criteria now proposed of 96 per cent or higher removal of BOD and 96 per cent to 98 per cent removal of phosphorus will require the addition of such facilities as chemical treatment of the effluent, with flocculation and sedmination, rapid sand filtration, and alkalinity correction. Such facilities are estimated to cost in the neighborhood of $3,000,000 to $4,000,000, and to bring the total annual cost to $2,500,000 to $3,000,000.

The discharge of treated sewage is but one of several items affecting the stream quality. Others are: silt from upstream; surface runoff, both direct and by way of storm sewers; and overflows from combined sewers. Unless and until there are substantial reductions in all of these, it is doubtful that the extremely high removals now proposed for sewage treatment will accomplish stream improvements commensurate with their cost.

The relative benefit to the river quality by the substantial elimination of phosphorus is at best uncertain. Based upon present limited knowledge, this alone could increase the cost of municipal sewage treatment to nearly double that for the removal of 90 per cent of the BOD. Data are lacking on phosphorus removal processes for large scale installations and on the river quality improvement that would result.

In our opinion, the need for and benefits from river quality standards of the levels proposed have not been adequately demonstrated.

We recommend that the program for improvement of the river water quality be staged, so that the costs incurred will in some measure be commensurate with the improvement. The initial step should not be more than that of upgrading the major sewage treatment works so that 90 per cent of the BOD can be removed. Such works are within the capability of demonstrated technology. Studies on the effects of silt reduction, on nutrient reduction and on the removal of other deleterious substances should be continued to establish the merits of, and priorities for, the control of each and all of these.

The costs of major improvements in pollution control will be so great that they should not be incurred on an areawide crash basis for speculative improvements in water quality. Prudence dictates a staged program for the construction of new works, and a continuing evaluation of the effects of such works on river water quality.

SECRETARY KLEIN: Any questions or comments from the conferees on my left?

(No response)

SECRETARY KLEIN: On my right? Mr. Stein.

MR. STEIN: Well, you have several points here on this, Mr. Hall, and let me start with a comment first.

We have discussed this at various engineers' meetings, and this is the thing that always amazes me about consulting engineers in this business--that they are always indicating that we have to go prudently and slowly.

When I started in this business, I used to think that all engineers were like that, until I discovered what we were doing in the roads program, in the automobile program and in the bridge program. Somehow those engineers always seemed to be going the other way, building bigger and better structures.

The point is that a report has been presented giving this data in our technical report on phosphorus removal processes for large-scale installations. We do have one working at Lake Tahoe.

Many of the major chemical companies are going out and have sales forces developed selling the material for phosphate removal which they said would work. Some of these chemical companies are the major companies and the most prudently managed companies, if I read the stock market returns correctly, and they have decided that this works because they are ready to do this.

Maybe you can indicate where the data indicates that this will not work. Where do you get the notion when you say: "In our opinion the need for and benefits from river quality standards of the levels proposed have not been adequately demonstrated?"

Sir, these water quality standards and river standards have been adopted by Virginia, by Maryland, by the District of Columbia and by the United States Department of the Interior. They have been through this process of holding the hearings, going through this, and have indicated that this is what the people want.

As I understand it, our technical staff has reported that if we were going to meet these standards that the people and the official bodies indicated were desirable for the Potomac, we have to do this work.

They also have analyzed the figures and indicated that there was sufficient data and plants to say that this could be done with present technology. If we listened to the other reports, I think they indicated it could be done, but they raised the question of money.

The last point I want to make before you may want to comment or rebut on this is precisely the point that Secretary Klein has made.

If we always get to the point that we need further study, that it has not been demonstrated, that we don't know how the taxpayers are going to get it, what we are faced with is a continuation of the Potomac in its present condition, and we are certainly not enhancing the water there.

The question here is: What do we do to come up with an active viable program that is going to improve this river other than the notion that we need further study and further demonstration?

MR. HALL: I assure you that what you say, the public and this group and those present feel that the water quality standards are desirable.

I say that under the present technology they are not attainable. It has not been demonstrated that they are attainable and will produce the desired results.

MR. STEIN: Sir, do you have any more than just your say-so? Our people presented data showing they are attainable.

MR. HALL: Yes, they did, and in my opinion that data are lacking on phosphorous removal processes for large-scale installations and on the river quality improvement that would result. This is my opinion here. This is what I mean.

SECRETARY KLEIN: Now, you are an engineer. How long have you been one?

MR. HALL: Oh, a quarter of a century.

SECRETARY KLEIN: Have you ever seen the Lake Tahoe plant?

MR. HALL: I don't think--no, I have never seen the Lake Tahoe plant, no, sir.

SECRETARY KLEIN: You know that they do tertiary treatment with removal of the nitrates and phosphates there?

MR. HALL: I am aware of that.

SECRETARY KLEIN: Do you know what their problems were in advance?

MR. HALL: Where does the effluent go from that plant?

SECRETARY KLEIN: Do you know what it removes at that plant there?

MR. HALL: Yes, sir. It does a very good job of removal on a seven and-a-half mgd scale plant. We are talking here in the Washington, D.C. area of plants on the order of four to 600 mgd, much larger scale.

SECRETARY KLEIN: As I understand it, the largest scale you get, the more efficient the sewage treatment plant is. It is just like a cement manufacturing plant.

MR. HALL: Say that again, please?

SECRETARY KLEIN: As I understand it, the larger you make a sewage treatment plant, the more efficiently it runs, just like the cement manufacturing plants.

MR. HALL: The Tahoe plant is a pilot plant and is not--

SECRETARY KLEIN: Have you seen Santee, California?

MR. HALL: No, sir, I have not.

SECRETARY KLEIN: Over there they make a sewage effluent into swimming pool water.

MR. HALL: This is what was coming out of the plant.

SECRETARY KLEIN: How can you make a determination when you have not even looked at the two main ones in the United States that actually do this?

MR. HALL: I know how to drive a car, but I have never gone through a plant in Detroit.

SECRETARY KLEIN: Yes, but now you are a sanitary engineer claiming professional competence. Have you looked at the Bacon Hanover plant in Chicago?

MR. HALL: Yes, sir.

SECRETARY KLEIN: What does he do there with tertiary filtration?

MR. HALL: He has rapid sand filtration. They have problems. There are problems.

SECRETARY KLEIN: He has gotten 96-98 per cent now; hasn't he?

MR. HALL: I don't know what it is.

SECRETARY KLEIN: Well, I will tell you that is what it is. I had lunch with him last Saturday afternoon, and he thinks this is going to work and he is going to phosphorus and nitrate removal in his plant.

MR. HALL: Let me go back to my statement. I say that "Data are lacking on phosphorus removal processes for large-scale installations and on the river quality improvement that would result."

SECRETARY KLEIN: Have you any alternative?

MR. HALL: Yes, sir, I have an alternative.

SECRETARY KLEIN: What is it?

MR. HALL: "We recommend that the program for improvement of the river water quality be staged, so that the costs incurred will in some measure be commensurate with the improvement. The initial steps should not be more than that of upgrading the major sewage treatment works so that 90 per cent of the BOD can be removed. Studies on the effects of silt reduction, on nutrient reduction and on the removal of other deleterious substances should be continued to establish the merits of, and priorities for, the control of each and all of these."

SECRETARY KLEIN: In other words, you say, "Don't do anything that might cost money."

MR. HALL: I have said we are in the process of making plans for upgrading the plant effluent in the Alexandria Sanitation Authority, which is going to cost $6 million. If you say that is not spending money, then that is your opinion.

SECRETARY KLEIN: No. I am talking about going farther than that.

Now, would you stake your professional reputation on the answer to this question: If you put the 90 per cent in there, are you enhancing the quality of the water in the Potomac?

MR. HALL: Yes, sir.

SECRETARY KLEIN: You are putting better water into it than you originally took out of it at the intake?

MR. HALL: I don't think there is a correlation between--

SECRETARY KLEIN: You bet there is. It got this way because everybody put in bad quality water. You can't put it back in without cleaning everything out of it that you possibly can.

That is the thing that you are missing.

MR. HALL: When the water is taken out for use, it has to be cleaned up before it is used.

SECRETARY KLEIN: Yes, but not much.

Would you drink it? You know you would not. You would not even swim in it.

No, this is the whole proposition, and everybody is begging the question.

MR. HALL: I am not begging the question, sir.

SECRETARY KLEIN: You are begging the question. What are we going to do to fix up the Potomac, and your 90 per cent won't do it, and I think that you, as a consulting engineer, should tell your people that this will not do the job, that we have got to find something else in place of it. I think that is part of your job, part of your profession, not just to meet some standards that are handed to you, but also to project forward. This is what has to be done.

MR. HALL: You hand me the standards, and then, if I have the confidence that that will do the job, I will go to the people and say this will do the job.

I cannot do this today, because it has never been demonstrated on a scale that we are talking about.

SECRETARY KLEIN: You have not even seen the demonstrations.

MR. HALL: I say that "Data are lacking on phosphorus removal processes for large-scale installations and on the river quality improvement that would result."

You are not listening.

SECRETARY KLEIN: I was listening. You have begged the question again. You say that we don't know what removal of phosphorus will do, and we tell you that removal of phosphorus and nitrates will remove a good deal of the algal blooms downstream, and that was what we put in here Wednesday afternoon.

MR. HALL: I think two days ago it was

said by one of the speakers on the podium here that if we did remove the 96 per cent phosphorous, that he did not have the assurance that the algal blooms would be removed because of the uncontrollable phosphorous that comes into the watershed.

SECRETARY KLEIN: He didn't say "uncontrollable." He said "uncontrollable at this time."

We know where it comes from upstream, and that is another part of it, but that does not mean that you can continue to put in phosphorous and nitrates downstream in order to compound the problem, and we do it a lot worse here than they do it upstream.

MR. HALL: I am not saying that we will intentionally put phosphorous in downstream to compound the problem. I am saying it has not been demonstrated that the 96 per cent removal will do the job.

I think that it is very desirable to clean up the river. This is one of the most desirable things that we can have in this Washington, D.C. area. This is our Nation's Capital. It is our heritage, and I agree one hundred per cent.

I question can it be attained with today's technology?

SECRETARY KLEIN: You bet it can be attained, but everybody is begging the proposition of getting it done.

MR. HALL: If I have assurance from you, from the Department of the Interior, from the Congress, when they set these water quality standards, that once these are met the stream will be cleaned up and we will not have to go back and ask for more and do more and do more, then I think that our client--I can't speak on behalf of our client, incidentally, but I think our client would be prepared to go to the people and say, "Yes, we can do it and this will do the job."

But right now we can't say that.

SECRETARY KLEIN: Now, you are begging the question of all scientific research, because we know that as everyday goes along, everything gets a little bit better as we go.

That is why we are here at this age, instead of most of us being dead already as our grandparents were, if I may put it that way, because we didn't have the scientific research. If they didn't keep on going and adopting all of these things as they went along, we would not be here.

The Atomic Energy Commission keeps getting better on atomic energy because they keep on working with it, they don't stop.

We can keep on getting better here. We can't give positive answers to anything in science. I wish we could, and then we could tell you what could be done, but I think the attitude here is absolutely erroneous, that you think you can put in 80 or 90 per cent returns from a treatment plant and come out with the answers of cleaning up the Potomac.

If you do, at the end of 1978, we will all be back here again, as many of us who are still here, and we will have a compounded problem.

MR. HALL: As I said before, Mr. Chairman, we are removing 70 to 80 per cent of the BOD. We have plans to remove 90 per cent of it. We say in here, and we stated that "Studies on the effects of silt reduction, on nutrient reduction and on the removal of other deleterious substances should be continued to establish the merits of, and priorities for, the control of each and all of these."

I have a program and it is in here. I am not begging the question.

SECRETARY KLEIN: Yes, you are just going to meet the 90 per cent and you don't have any alternative for really meeting the problem, or a positive approach.

What do you do to clean up the Potomac? Will you stake your reputation on it that 90 per cent in your case will clean up the Potomac?

MR. HALL: I did not say that 90 per cent would clean up anything.

SECRETARY KLEIN: Well, then you are practically saying, "It won't do the job, but I don't want to go any farther."

No, sir, you can't get away with this. I am going to call for direct answers on this.

MR. HALL: The cost of major improvements in pollution control will be so great--

SECRETARY KLEIN: Sir, I have read it and I have heard it and I have heard it and I have heard it. I asked you on the 90 per cent. You can't get away with it.

Now, what have you got as a positive alternative to get the job done?

MR. HALL: As of this point in time and technology, there is no positive answer.

SECRETARY KLEIN: I am sorry; FWPCA said there was and backed up their statement.

MR. HALL: I place a different interpretation on what the Federal Water Pollution Control

Administration said.

SECRETARY KLEIN: I suggest you take trips to Santee and Lake Tahoe and find out what they are doing and take a look at the Blue Plains plant out here and see what they come out with.

MR. HALL: I will be glad to.

SECRETARY KLEIN: Anything further from the conferees?

(No response)

SECRETARY KLEIN: Mr. Paessler.

MR. PAESSLER: Mr. Chairman, I have at this time a statement from the city of Alexandria, Virginia, that we have been asked to make a part of the record. I believe these statements are available to you and if this be satisfactory to the conferees, I would like to have it so ordered.

SECRETARY KLEIN: Shall do, Mr. Paessler.

(The following statement was submitted for inclusion in the record:)

STATEMENT FROM CITY OF ALEXANDRIA, VIRGINIA
RE: RECOMMENDATIONS OF FWPCA REPORT ENTITLED
"POTOMAC RIVER WATER QUALITY" DATED 1969
TO BE PRESENTED TO THE RECONVENED
CONFERENCE ON POLLUTION OF THE POTOMAC RIVER
WASHINGTON METROPOLITAN AREA
APRIL 2, 1969

Gentlemen:

This statement has been prepared as a result of recommendations submitted to the Conference in the FWPCA Report, "Potomac River Water Quality--Washington, D.C. Metropolitan Area, dated 1969; and in particular to Paragraph 3 of Recommendation 4 on Page 9 of that report.

The paragraph referred to recommends that "Alexandria undertake a program commensurate with that of the District of Columbia for control of raw service discharges through combined sewer overflows and diversions." I would like to make it clear that the city of Alexandria does not disagree with the objectives of the recommendation; in fact, for several years the city has been actively pursuing a program of separation in parts of the old city which contains the major portion of our combined sewers. Over $500,000 has been spent in recent years (1962-1969) for separation construction in our Urban Renewal area and on a major combined trunk line known as the Ten Yard Ditch. Studies are now going forward for additional separation projects in areas which are plagued with basement flooding as a result of overloaded combined sewers.

Unfortunately, while we recognize the problem as it relates to pollution of the Potomac, the fiscal aspects of the separation program are beyond our foreseeable capabilities, unless State or Federal aid is made available. We have at least 30 miles of combined sewers within the area east of the RF&P Railroad--a conservative estimate of cost of reconstruction would run between 15 and 20 million dollars. Even then the implications are staggering, when one contemplates the disruption of traffic, commerce and residential areas due to the necessity for tearing up existing streets, relocating utilities and connecting existing building to new sewers. Alexandria's sewers have been in existence for at least 100 years and for the first 60 years, at least, all sewers were constructed as combined sewers.

It is hoped that research now under way

may point out means to solve this problem without a massive dislocation such as we have previously envisaged. In the meantime, as funds become available, every effort will be made to continue with our present efforts but it must be realized that final elimination of combined overflow will probably be many years in the future, barring some technological breakthrough.

In closing, I might point out that, while we admit the problem, Page 21 of the report points out that Alexandria's contribuions to pollution from this source amounts to 86 million gallons per year. Table 3 indicates that, by 1969, the District of Columbia will still be contributing 1,152 million gallons. Thus, the Alexandria contribution is only about 7.0% of the total from the two jurisdictions which have combined sewer overflow. Hopefully, we will be able to materially reduce this percentage during the next 30 years to a minimum.

MR. PAESSLER: At this time, I would like to ask if there are any other statements from the political subdivisions in the area that they would like to put into the record?

(No response)

MR. PAESSLER: If not, Mr. Chairman, I am now prepared to make my statement.

SECRETARY KLEIN: Thank you, Mr Paessler.

STATEMENT OF
MR. A. H. PAESSLER
CONFEREE AND EXECUTIVE SECRETARY
VIRGINIA STATE WATER CONTROL BOARD

MR. PAESSLER: The Board's records show that it started an active campaign in late 1946 against the principal Northern Virginia communities--the County of Arlington, the city of Alexandria, and the County of Fairfax--that constitute the major dischargers of waste to the Potomac River in this area, directing them to install treatment for their sewage.

Concurrently, the explosive expansion of Northern Virginia was creating new housing subdivisions right and left--all of which were generating new sewage that had to be discharged somewhere. Some of the subdivisions could tie on to existing sewer systems; a practice that the Board fought by denying connections until Alexandria, Arlington, and Fairfax were financially

A. H. Paessler

committed to programs for constructing sewage treatment plants.

However, many of the proposed housing developments were remote from existing sewers, and sought the Board's permission to build their own sewage treatment facilities. The period 1946 to roughly 1955 saw the construction of perhaps 20 small sewage treatment plants to serve housing developments. Despite the problems of operation attendant with these plants, and the odors and other nuisances they caused, they were the stopgaps needed to prevent wholesale pollution of the small Northern Virginia watersheds. We can fortunately write off this period, for all but a few of these sewage treatment plants have now been abandoned and the sewage treated in plants operated by the communities.

The stories of the communities in providing the sewage treatment facilities they have today, and their plans for the future have just been related.

At this point, I would like to digress to say that the Water Control Board faces problems similar to that of the Tidal Potomac below Washington in several other areas. One of these is no farther away than the Occoquan Creek watershed, which happens to be a Potomac tributary. The threat of eutrophication of a public water supply lake at the lower end of this watershed is so serious that the Board has invoked a moratorium on further sewage treatment plant construction which has had the effect of virtually stopping development. A 2-year study of the watershed now under way is expected to provide the answers that will form the basis upon which the Board can formulate sound policy regarding treatment for proposed future discharges of sewage.

One of the most extensive experimental facilities for testing the efficacy of nutrient removal and other advanced waste treatment processes is at the Greater Manassas Sanitary District, which is in the Occoquan watershed. We expect that knowledge that is developed here will be of benefit in the Potomac and elsewhere. The new County of Fairfax Pohick pollution prevention plant also has incorporated in its design the capability of pilot scale nutrient removal processes--which may eventually be installed on a full-scale basis.

The reach of the Potomac River we are considering has been in the limelight because its water quality has deteriorated while population has grown at an unprecedented rate. Meanwhile, the public has become increasingly aware of the need for pollution abatement and control, and has, accordingly, been more insistent and demanding that immediate and appropriate steps should be taken by Federal, State and local governments to achieve stream quality goals consistent with maximum beneficial uses for all. Also, the solution to the problem has become more difficult to achieve. Ironically, the straightforward solution of the immediate past, that of removing oxygen-consuming organic material, bacteria and solids, has contributed to the creation of a "secondary" pollution problem by making the water clean enough for algae to proliferate and "bloom." The "peasoup" appearance of the river during these blooms has caused many persons to remark that the Potomac is in worse shape now than it ever was. Unfortunately, the solution to eliminate the peasoup is far from straightforward.

Based on biochemical oxygen demand, Virginia contributes to the Potomac River about 23% of the Washington metropolitan area sewage load. While the Virginia people must, of course, depend on the river as the ultimate repository of this sewage after adequate treatment, they also want to see the river concurrently suitable for all reasonably attainable goals. Therefore, they should, and will, assume their proportionate share of the responsibility, along with their District of Columbia and Maryland neighbors, to do whatever is necessary to achieve reasonably obtainable cleanup goals.

We can all agree, and that is why we have gathered here, that the time has come for us to reason together to develop a cooperative and comprehensive program which will achieve such goals. As a representative of the Virginia agency that will have to implement such a program, I would like to enumerate some pertinent points that we think this Conference should consider.

About a year or so ago, the staff of the Board began negotiations with the Northern Virginia political subdivisions to establish goals for further Potomac River cleanup. These goals included a high degree of BOD and nutrient removal, and were based on what appeared at the time to be reliable thinking of the Federal Water Pollution Control Administration (FWPCA). The political subdivisions have subsequently established schedules for achieving the goals, based on the then current FWPCA thinking, and you have already heard them outline these schedules. We should note that FWPCA's recommendations in its report "Potomac River Quality--Washington Metropolitan Area" differ markedly from the previous ones, on which we have already based regulatory actions. We hope that the planning which the political subdivisions have already done will not be too seriously disrupted by the fact that the target has now moved somewhat out of range.

We agree with the conclusion in FWPCA's report that extremely high orders of BOD and suspended solids removals from all existing discharges will be necessary to insure that satisfactory dissolved oxygen levels are maintained in the Potomac now, and in the future as population continues to increase. To accomplish these removals will mean the installation of advanced waste treatment facilities.

Advanced, or so-called "tertiary" treatment processes to effect the required removals of waste constituents are available, and the Board's staff stands ready to recommend to the Board that it require their installation by the Virginia communities. However, FWPCA's recommendation for a very high order of phosphate removal prompts us to ask some questions.

One question that has already been raised, assuming every bit of nutrient material (both nitrogen and phosphorus) from sewage sources was removed from the

Potomac Estuary, is whether algae nuisance problems would be eliminated or substantially alleviated? While it seems reasonable to assume that removal of phosphate only, as recommended, would make algae blooms less frequent and intense, no one at this conference has been able to express quantitatively the betterment that may occur. Removal of substantially all of both nitrogen and phosphorus would make more reliable the prediction that fewer and less intense algae blooms would occur, but no one at this conference has said positively that they will be eliminated, nor again, to quantitate the betterment.

Another factor that must be considered is that as BOD and suspended solids are further eliminated from the river, will it become still clearer, making it even more suitable as a habitat for algae than it is now? What this means in terms of nutrient concentrations which will cause blooms is another unknown that should be determined.

You have just heard representatives of the Northern Virginia communities express their willingness to cooperate with requirements to further clean up the Potomac, but you have also heard what the cost of such cooperation, in terms of installation of nutrient removal facilities, will be.

We would expect that, before they translate their cooperation into dollars that their citizens must pay, they will want answers to such questions as:

1. Will these tremendous expenditures effect a total solution?

2. In the absence of a total solution, how much improvement will be effected?

3. Will the addition of phosphate removal now be sufficient, or should nitrogen removal also be installed?

4. After complete or substantial removal of nutrients from sewage sources, will the influence of nutrients from presently uncontrolled sources be sufficient to cause algae problems?

5. Have FWPCA's suggested measures for removal of pollutants taken into account the projected population growth in the Washington metropolitan area to insure that there will not be a recurrence of the same problems in the future?

The Metropolitan Washington Council of Governments has suggested to the Secretary of the Interior, in a recently adopted resolution, that FWPCA "enlarge and intensify" its studies to provide answers to the foregoing and the many other questions that have been asked about the Potomac estuary.

One may say that it is only natural for COG to suggest "another study" of probably the most studied stream in the world, because this might "buy" time and delay for the members of COG, who must spend the money for any Potomac cleanup efforts. However, they cannot take lightly the possibility that they may have to spend hundreds of millions of dollars in capital costs and millions every year for operation, when we regulatory people have to admit frankly that we cannot guarantee them a positive solution to the problem.

Financing raises the question of the availability of Federal construction grant funds. In each of the past several years Virginia has received something in excess of four million dollars in Federal grant funds to assist local governments in construction of pollution abatement facilities. It is apparent that if something resembling the recommendations in the previously referred to FWPCA report are adopted as the recommendations of this

A. H. Paessler

Conference, all of the Virginia grant funds for one, and perhaps two years, could easily be totally absorbed by the three Northern Virginia communities in the construction of the facilities necessary to implement the recommendations. Thus, we would be unable to provide funds to assist other localities striving to meet the Board's water quality objectives in other parts of the Commonwealth. To be fair, the Board must also be responsive to the needs of these other localities.

Thus, to finance the additional extensive and expensive advance sewage treatment facilities needed in the Washington metropolitan area will undoubtedly cause the Virginia communities to seek additional Federal funds, either in the form of increased appropriations under P. L. 660 or special appropriations earmarked for cleanup of the Potomac. You have heard several speakers at this conference say that cleanup of the Potomac River in this area would appear to be a special case, since we are really dealing with a national problem in the sense that the Federal Government is the prime factor in its creation. Therefore, we would hope that Congress will look favorably on appropriating additional funds to aid the localities in making the Potomac a model in the show window of what can be achieved in the field of water quality management.

In concluding, let it be known that we are squarely in favor of finding a solution to the several facets of the Washington metropolitan area Potomac River pollution problem, and we will do our best to see that the conclusions of this Conference, as they apply to Virginia, are implemented, within the bounds of what is practicable of attainment.

Following such implementation, it seems reasonable to conclude that scientists will be able to sample and analyze the river and thereby demonstrate that its quality has been improved and enhanced. However, we cannot help but wonder if the average citizen, who will then be paying rather heavily for the implementation, and who will have only his eyes and nose available for testing, and who will still see peasoup frequently, will wonder if the "enhancement" is worth the money spent. As long as every=one concerned recognizes these facts, then I say "full steam ahead."

SECRETARY KLEIN: Mr. Paessler is at the rostrum. Are there any questions on my left, gentlemen?

(No response.)

SECRETARY KLEIN: On my right?

(No response.)

SECRETARY KLEIN: I would just like to make a couple of comments in reply to some of these "no total solutions."

I don't have total solutions. All I know is this will improve the river and start upgrading it again, and that is enhancement.

I think we are going to have removal of both nitrogen and phosphates, and we don't know whether we will be able to control all of them upstream, but I understand that a good many of the fertilizer nutrient pollutant items from upstream are from cities upstream and we may be able to get into that.

I have discussed this with Mr. Johnson

and he needs some help on a compact in order to be able to get it done properly.

I think our suggested measures with the 16,500-pound limitation have taken into account population growth in the future.

If I may now, I would like to make a comparison. May I compare it to transporation? We started out walking and then we got horses, and then we got the old type trains, and then we got better and better locomotives and they traveled faster and got there better and more comfortably every day.

We started with poor automobiles, and now we have pretty good ones, and we get better roads all the time.

We started with a plane that just about got off the ground, and now we have supersonic transport.

Every step along the way we were not quite sure what we were going into next, but right now we know that this is a step toward improvement and enhancement of water quality in the Potomac. It is not just guesswork on that part of it. How much it will do we can't tell you because there are innumerable other factors, but the greatest factor by far in this area is the sewage treatment plants because there isn't much industry. There may still be some algal blooms in here.

This is our major responsibility and we can't pass it off to other people. There is no industry here to be the whipping boy. All we have is upstream to blame it on, and they are not putting that much in there, so we can't pass it on to other people. It is right here at home with us and it keeps coming back to the Federal Government.

I will tell you, the Federal Government mails out the paychecks to everybody in the area, and I think in most cases they are pretty good paychecks, and I think on the basis of that, we are getting projections of $1 extra per month per family to pay for this, and I don't think that is very much.

The only reason we get great big figures is because you lump a lot of people into it and multiply that $1 out per month and you come out with fantastic figures.

I will tell you that the Metropolitan Sanitary District of Chicago at the last count had $800 million in their capital improvements, and they don't think that is enough, and we are trying to go to tertiary and removal of nitrates and phosphates there, and nobody is jumping on Vint Bacon and the board of trustees there. They are doing this on their own.

Mr. Paessler, does that finish your presentation?

MR. PAESSLER: I have several other entries for the record here.

SECRETARY KLEIN: Fine, go ahead.

MR. PAESSLER: We have a statement from the Northern Virginia Conservation Council by Mrs. Samuel V. Moore. I will call on her for her presentation.

STATEMENT OF
MRS. SAMUEL V. MOORE
NORTHERN VIRGINIA CONSERVATION COUNCIL

MRS. MOORE: My name is Mrs. Samuel Moore and I am here today representing the Northern Virginia Conservation Council, whose membership is made up of individuals and civic organizations mainly in Fairfax County, Arlington County and Alexandria.

You know, as somebody interested in the cause of conservation, I have seen such a change in attitudes in my own community in the last few years. It used to be that we were a bunch of baggy-eyed bird lovers, but all of a sudden, in the last few years we have become respectable, and the reason we have become respectable is because the average citizen, Mr. and Mrs. John and Jane Citizen, have become concerned, and you can see it reflected at election time.

You know, the politicans get up and they really wax enthusiastic about open space and clean air and clean water, but, somehow or other, at least in our communities, particularly in Fairfax County where I live, something happens between election promises and what is actually carried out.

The people at this point are still the Government. I guess it would be very bewildering to listen to all of these politicians at election time for a new resident, somebody who doesn't understand land development economics, to find out, for instance, the facts that are going on, the fact that the bulk of the monies, the resources, the capital facilities resources that we have available for sewage treatment plants and for sewers is going into opening new areas to residential development, rather than improving the standards of treatment at existing sewage treatment plants and providing sewer service to some of our homes where the septic systems have failed, like I think what Mr. Stein was referring to a little while ago.

As a matter of fact, I just for fun checked the fiscal 1969 budget of Fairfax County before I came in and I found out that the capital monies to be spent this year come to $15.2 million, of which $13.5 million is going into the new sewage treatment plant, the Pohick that you have heard referred to here, and into the Pohick sewer and other sewers to open up new areas of the county, the Pohick and the Occoquan Basins, and of the $1.7 million remaining, I can't tell that that is all going into the developed part of it. I know that our budget now is $352,000 for something called "developers' projects", which I don't really know what it is.

It might also be confusing for somebody who didn't understand the economics of land development to find out that it is a common practice which goes on just every day and nobody gets excited about it any more, that we zone for densities way above what was planned for when the existing sewage treatment plants were built.

Fairfax County has had a very fine sewage treatment ordinance on the books for some two or three years, but to my personal knowledge it has never been enforced yet.

The fact is that homebuilding is our big industry. Unfortunately, when the interests of the homebuilders collide with the interests of the people for a clean and attractive environment, and it happens all the time, the people usually lose.

The problem is one of financing. In a rural urbanizing area, it is just not fair to take the cost of the capital facilities out of taxes. It is not fair to tax the farmers. They don't need them and they don't want them. And in a fast-growing area, the borrowing ability that you have is very limited, and, unfortunately, what limited ability we have seems to go continually into new sewers for new areas and to school construction for these areas, and what would be a big problem for us in coming years, into the cost of a very substantial contribution towards transit construction, again, something that we need very badly, but something that is going to compound the problem of growth and, at the same time, limit the money that we will have available for other facilities.

With the full realization that the costs are going to be very heavy, especially in Fairfax County where apparently the policy is to encourage the area's fastest residential growth, the Northern Virginia Conservation Council fully supports whatever taxes it will take to pay the costs of upgrading treatment of the sewage treatment plants emptying into the Potomac.

We believe, although we have no way of proving it, that the people in the area will do likewise if they are asked.

Yet we need a big help and a big incentive if encouragement should be held out to our jurisdictions in the form of grants from the State of Virginia, and, we would hope, from the Federal Government.

We would like to respectfully suggest that when the Virginia State Water Control Board makes up its new budget that they include money for such incentives.

We are not in principle in favor of Federal intervention. We like to see decisions made locally, and we have become very discouraged over the years as to how these decisions come out.

If, however, our Governments are unable or unwilling to act, we would hope that the State of

Virginia and the Federal Government would intervene.

We would also like to respectfully suggest to the State Water Control Board that they consider reviewing the standards for the streams in Northern Virginia. In urban areas you are not going to find a stream where children are going to play, and we would like to see the standards for these streams revised so that it would be safe to play in or near these streams.

We thank you very much for giving us the opportunity to be heard.

MR. PAESSLER: Thank you, Mrs. Moore.

SECRETARY KLEIN: Are there any questions on my left?

MR. STEIN: Mrs. Moore, you talked about taxes. Would you be willing to pay a user fee for treatment of the sewage and a clean river?

MRS. MOORE: Most certainly. I am sure the people in the county would, too.

MR. STEIN: Mrs. Moore, I know you are very familiar with the county. That is because we have seen each other many times back at home. You know the kind of area we live in.

Do you think the people could afford the amounts we were talking about here?

MRS. MOORE: Oh, I think they could manage it very easily, yes.

MR.STEIN: Thank you.

SECRETARY KLEIN: Any questions from the conferees on my right?

MR. JOHNSON: I have one question.

SECRETARY KLEIN: Mr. Johnson.

MR. JOHNSON: I think probably my question will need to be answered by Mr. Paessler.

You make a reference, Mrs. Moore, to the granting of aid from the State of Virginia and your statement indicates that the Water Control Board has this authority. Is this correct or not?

MR. PAESSLER: Yes, this is right, Carl. The 1968 General Assembly amended the State Water Control Law to stipulate that any grant in aid program for sewage treatment plant construction in Virginia would be administered by the State Water Control Board.

The 1968 General Assembly, I might add, did not implement this authorization with any funds.

MR. JOHNSON: Thank you.

SECRETARY KLEIN: Thank you, Mrs. Moore.

Mr. Paessler?

MR. PAESSLER: I have one more item, and this is a request from Mr. Stewart Finley, Chairman of the Northern Virginia Soil and Water Conservation District for an opportunity to make a statement.

Mr. Finley.

STATEMENT OF
MR. STEWART FINLEY
CHAIRMAN
NORTHERN VIRGINIA SOIL AND WATER CONSERVATION DISTRICT

MR. FINLEY: First, allow me to speak as an imprudent citizen of Fairfax County before I speak for my organization.

If we remember back to 1954, when I first started trudging around from outfall to outfall, and I recall seeing Mr. Stein at the same time with the same interests he now has, you have to remember that Arlington County could not be convinced to have secondary treatment, the District of Columbia was extremely reluctant to have secondary treatment and thought it was impossible, Alexandria had no treatment plants, which was a ticklish situation, the Bladensburg Sewage Treatment Plant, miserable thing that it was, was there and was there for keeps, the West Virginia Pulp and Paper Company which has since spent several million dollars for improvements had to be convinced, and Fairfax County had a small treatment plant in miserable shape all along its little streams.

It seems to me that industrial development has managed to pay for all of these things. They are all functioning and working, and it is not beyond the realm of reason that the improvements that you suggest here in going to advanced waste treatment might not be practical and accepted over a period of time.

However, I would like to speak on behalf of the Northern Virginia Soil and Water Conservation District and on behalf of the Urban Committee of which I am Chairman, and perhaps on behalf of a lot of other people who aren't here today on a subject that will digress from your happy sewage problems, if I may.

First of all, George Washington obviously goofed when he located the capital city where he did at the head of the estuary. He obviously should have located it above Great Falls so that we could have all the erosion we wanted and turn this whole thing into a joint morass and we wouldn't have these difficulties, but Mr. Washington made his mistake and we have our city and we have an investment in it, and obviously it behooves us not to fill our river up with sediment, although we have made a very good start on doing that already. Sediment pollution is expensive, and you can actually put a dollar value on it when you are talking about still waters, such as lakes, reservoirs and estuaries, and of course there are real damages to flowing streams too.

The Soil Conservation Service of the Department of Agriculture, when it began, invested a tremendous amount of energy in developing an effective technology for controlling erosion and resulting sedimentation, and they have developed a fair program. I use the word "fair" on purpose, because it is obvious to anyone who has studied this that there are significant deficiencies in agricultural erosion control, deficiencies that should be corrected and that can be corrected with improved practices.

However, as far as sediment production is concerned, the scandalous situation today is urban development, urban erosion and sedimentation. Tremendous quantities of material are being generated, for example, at Washington's suburban areas, and effective programs have to be developed.

Let me tell you about such of these programs as I am familiar with.

Throughout the United States, very little attention has been devoted to urban erosion sedimentation. Much of the leadership had taken place here. Much of it is due to Carl Johnson, the executive director of the interstate organization, and his predecessor, Mr. Tisdale, Montgomery County and its soil conservation district, Prince George's County and their configuration, and our organization in Northern Virginia which covers Fairfax and Prince William Counties, all of what I would refer to as good programs.

Now, when I say "a good program", I do not mean that it is adequate. I mean it is better than average for the country and needs substantial improvement and is on the road toward achieving that improvement.

In Fairfax County, and here I find myself in the interesting position of not totally agreeing with Mrs. Moore who testified before, we have an effective erosion and sediment control law, and I would like to explain why it is effective.

It is effective, not because it has been cited by the commonwealth attorney as something to be dragged into Court, but it is effective because it utilizes the sound theory that instead of trying to make the builder and developer into a criminal and drag him into court, trying to get damages out of him, which is obviously ridiculous and cannot be achieved, we have devised an erosion control ordinance--I will use that term that "we have devised"--which ties all of us into the development process.

In other words, when a builder or developer is going to develop, at the time that he tries to obtain permission and establish specifications for his roads, his guttering, his underground drainage and all of the other utilities he puts in, he must agree to a conservation plan and he must file in connection with the conservation plan and must live up to it.

So, in other words, the thing of merit of our erosion control ordinance is the fact that we are not dragging anybody into court and we are not exercising the option of grabbing this bomb.

This is not to say that there are not some people who are causing difficulties, and I can trot around my own little county and point out some difficulties that have to be corrected, but the basic point is that if you can stop making the man into a criminal and start getting him to function with an ongoing system, you have a pretty effective scheme.

The scheme will work. It is affirmative instead of being negative, and we feel that even though the thing is young, that it can grow and improve.

I was interested to hear two criticisms of our Pohick project.

We have a 32-square-mile watershed emptying into the Potomac River. We have a public law 560 program. We are going to build eight impoundments and cascade into this area. It has been authorized and is now being funded. We have $5 million allocated for this. $1 million is for the soil conservation service to build these structures; $1 million is for the land that goes under them and local contributions in the form of easements; and $3 million of local contributions are for land treatment.

Now, virtually nobody understands this land treatment method, but what we are really talking about is that the people who are building and developing are going to contribute approximately $3 million, not in money but so much per lot, it's like, informing sensible conservation procedures.

We have a new technique that is spoken of in a news letter which I would hand a few copies out of, which is called "A New Tool in Urban Development." It is a soil slope map. This method goes beyond previous soil considerations which were primarily organized on the basis of structural ability or percability.

It goes into a number of things that are fundamental to conservation, and these are fed into the process prior to zoning in such a fashion that they can be the determinant in the zoning.

With this data that associates itself with these soil slope maps, it is possible for a developer to organize his density and organize his plan of development in such a fashion that he will utilize the land in a more practical method and possibly conserve some of it for green spaces, etc.

We feel enthusiastic about this new tool, again because it is an affirmative tool. We are not standing around and wailing and moaning about what the developers are doing. We are not saying that everything has to be developed immediately, but we are saying that we are trying to work with the development that is inevitably going to exist in order to make it a practical and workable arrangement.

And so I am somewhat surprised when people criticize the Pohick. We would complain bitterly if there were no sewers, we would complain bitterly about the sedimentation, but no, we have the sewers, we have the treatment plant, we have the pilot plant that will remove nutrients in that plant, which is planned, I understand, and we have a 32-square-mile area in Fairfax County that, when this is completed, will never contribute a ton of sediment to the Potomac River.

Now, the point of my asking for time here today is this, and I make this suggestion respectfully:

Tne Federal Water Pollution Control Administration does not have an effective sediment control program or sediment pollution program. We have a committee. Mr. Cook is very competent. But committees don't do things effectively.

You need to paint a sign on the door, "Sediment Control Program." Put the guy's name on the door, give him a typewriter, give him a girl and give him a couple of technicians who are equally qualified.

You need to develop a program, figure out what the program is going to be, evaluate such matters as should there or should there not be matching grants as in the case of sewage treatment plants in connection with your urban erosion and sedimentation.

This I suggest respectfully, and I carry the suggestion one point further, suggesting that your R&D program should actively encompass sediment pollution.

Now, I can see that a small R&D grant has been given to the National Association of Counties in connection with the booklet which is being put out which is very favorable, but I recall a few months ago when I traipsed down to Mr. Seidman's office making the proposal that they would make a grant in order to permit us to develop an urban silt trap.

There is no such thing in America today as a generic urban silt trap. This is as fundamental to silt control as a sewage treatment plant is to sewage control.

The answer is that if we would develop, if we would design the urban silt trap, then they would give us the grant so that we would have the money to design the urban silt trap.

Now, this is bureaucratic nonsense, and I would like at some stage of the game to be invited downtown to meet all of the happy people at the Federal Water Pollution Control Administration and talk about this matter further.

I say all of this respectfully, because I think that what is really needed in sediment control is help. You have to have a lead in your advanced waste treatment. You have emphasized this here. You need the same lead in sediment control, and while the soil conservation service can provide technical guidance, the soil conservation service is not in the pollution control business and you people are, and we would like to cooperate with you and we would like to have your assistance.

Thank you.

SECRETARY KLEIN: Mr. Finley, thank you very much.

My office number is 4160 in the interior building, and I invite you to stop up and talk to me on this, because I have given instructions to all research agencies to find new ideas on projects.

Second, I have run into this already, because all of you read about Oakley Reservoir in the University of Illinois and Champlain, and one of the problems is that Lake Decatur gets 160 acres of ground one foot deep added to it every year, and that is real sedimentation.

I have also concluded that that was part of the pollution problem as far as I was concerned.

So I shall be glad to take this up with you personally.

Now, I have certain other items.

Do any of the conferees on my left have any questions?

(No response)

SECRETARY KLEIN: On my right?

(No response)

SECRETARY KLEIN: One of the questions is this: We are going to spend a lot of money on some creeks up there. Will they work positively and totally?

This is the question that has been thrown at me all morning. Will they work positively and totally?

I know what your answer is going to be.

MR. FINLEY: I am not very prudent.

SECRETARY KLEIN: You are going to say "No, it is not going to work positively and totally," but you are going to try it because it is a step in the right direction; isn't that correct?

MR. FINLEY: That's right.

SECRETARY KLEIN: This is the point I have been making all morning. I can't prove that they are going to do everything either on the 96-98 per cent, but it is a positive step in the right direction and it is a big giant step.

I want to congratulate you, because I have been working along on this, too. One of the members of my Commission in Illinois was the watershed man of the year for 1966, Mr. Elmer Smith. You might have run into him from time to time. He is with Caterpillar Tractor, and you don't have to ask them to do any anti-pollution work. They are out in front of everybody else.

I just want to thank you.

MR. FINLEY: Thank you.

SECRETARY KLEIN: It was a very effective presentation and I think the point got home.

MR. FINLEY: Thank you.

SECRETARY KLEIN: Mr. McKewen, do you have a paper that you would like to have entered into the record?

MR. McKEWEN: Mr. Chairman, we have received copies of a paper from a Mr. Victor B. Bowling on behalf of the Charles County Chapter of the Izaak Walton League of America, and I request that this be entered into the record of the conference.

SECRETARY KLEIN: So ordered. It will be entered.

(The following document was submitted for the record:)

THE IZAAK WALTON LEAGUE OF AMERICA
Charles County Chapter
March 25, 1969
Re: Potomac River Pollution

Gentlemen:

I would like to bring to the attention of this commission and other groups dealing with pollution in the Potomac River the following: Insofar as the residents of Charles and St. Marys Counties are concerned, pollution in the Potomac River starts in the Washington D.C. area.

It seems to me from what I have read in the newspapers that the Planning Boards and the Potomac River Basin Committee are concerned only with the section of the river around and above Washington D.C. while the situation below Washington continues to grow worse. As the suburbs in Virginia and Prince Georges continue to build, so does the pollution in the Potomac River.

At this time, recreational facilities of the river are almost nil. There are no areas in this section that are safe for swimming or water skiing and fishing is no longer a pleasant pastime because of the odor and filth.

During the fishing, crabbing and oystering seasons in Charles and St. Marys Counties, more people use the lower Potomac River commercially and for recreation in one day than will use the upper basin in a month. The economy of Charles and St. Marys Counties depends largely on the fish, oyster and crab industries. Between these three seasons, the Potomac River furnishes year-round employment for many people.

The river between Indian Head and Washington is already useless both commercially and for recreation. There is a decided odor; fish caught are unsalable; shellfish have disappeared. Any boat put overboard is ready for a cleaning job a few hours later because of filth and siltation problems.

Dredging for gravel and sand in the estuaries causes tremendous silting problems. This should be stopped because it ruins the productive potential of the marshes--destroying spawning grounds for many fish and nesting areas for birds and ducks.

I think I can truthfully say that the Potomac River will be of little use or economic value for anything except sewer purposes and navigation within ten or fifteen years at the present rate of decline.

Victor B. Bowling, Chairman
Water Pollution & Safety Committee
Charles County Chapter

* * *

SECRETARY KLEIN: I think that was all you had, Mr. Paessler?

MR. PAESSLER: Those are all of the Virginia presentations that I know of.

SECRETARY KLEIN: Fine, all right.

Dr. Yates Barber of the Department of the Interior, Bureau of Sport Fisheries and Wildlife.

Dr. Barber.

DR. BARBER: Thank you, Mr. Secretary.

STATEMENT OF
DR. YATES M. BARBER
STAFF ASSISTANT
ASSISTANT DIRECTOR-RESEARCH
BUREAU OF SPORT FISHERIES AND WILDLIFE
DEPARTMENT OF THE INTERIOR

DR. BARBER: Mr. Secretary, ladies and gentlemen:

The great abundance of the early Potomac River fisheries has often been related. It is difficult today to comprehend the seemingly limitless supplies which the early settler found. George Washington operated one of the first organized commercial fisheries in the Potomac River for 40 years, beginning in 1759. Detailed records show that his principal harvest consisted of shad and river herrings.

Details of other Potomac River fish catches are also available from the records of George Chapman, who operated a haul seine at Chapman's Point, near Indian Head, from 1814 to 1824. Using a 350-yard seine, he took almost 1 million shad during the eleven-year period, an average of about 340,000 pounds each year. If we assume that there were 100 such fisheries on the Potomac during this period (and we know that 150 such fisheries operated a few years later in 1835), then the annual catches must have exceeded 30 million pounds. Records show that during a six-week period in 1835, 22-1/2 million pounds of shad were caught in the Potomac. The harvest of shad, and probably other fishes as well, was prodigious by any standard. These early catches certainly exceeded any recorded in the official records dating back to 1857.

The total shad catch of the Potomac often exceeded 2 million pounds annually until the 1900's. The catch has fluctuated widely, but its trend has been steadily downward. For a seven-year period ending in 1963, the average annual catch of shad in the Potomac River was only about one-quarter million pounds.

While factors other than pollution may influence this abundance, one needs but take a few boat rides around the upper Potomac estuary on quiet summer days to realize that the present condition of the Potomac is the first and most logical factor to suspect.

The reach of the Potomac, from about the 14th Street Bridge for some 20 or so miles downstream, is not particularly unique in that it has a severe pollution problem. In the course of reviewing the various State water quality standards it has become obvious that a great many of our estuaries have similar problems. Many of the early settlements which were located at or near the head of navigation on our coastal rivers and bays have today grown into great cities. Washington, Richmond, Baltimore, Philadelphia, and Mobile are but a few examples. Today the wastes of these cities, even when given an effective secondary treatment, can still threaten to "overwhelm" the tidal headwaters of the estuaries during the critical, warmer, low-flow periods of the year. Here at Washington we are especially fortunate that we have no oil refineries, chemical plants, pulp mills or other major industrial discharges to further complicate our waste control problems.

The importance of the estuaries as spawning and rearing areas for most species of sport and commercial fish taken in our coastal waters is well recognized. The Congress, through Public Law 90-454, the Estuary Protection Act, has authorized an inventory of the Nation's estuarine resources to determine what may be needed to insure a multiple-use approach in management of these resources.

We have long known that the uppermost reaches of the estuaries, at head of tide, and generally in the zone of brackish water where salt and fresh are mixed, are some of the most vital spawning sites for anadromous fish. Of equal, and sometimes greater, importance is the function of this zone as a nursery area for the young of the species.

Shad, herring, and striped bass are three popular species of anadromous fish which spawn in the Potomac. While many herring use tributary streams for spawning, the shad and striped bass spawn in the main stem of the river, almost entirely upstream of Maryland Point. While much of the spawing occurs in the Quantico area, many fish penetrate as far as Chain Bridge for spawning.

Dissolved oxygen levels are probably favorable for adult fish during most spawning runs because of high spring flows and cool water temperatures. However, heavy silt loads probably have adverse effects on many of the eggs which are cast free to drift in the current. The most serious effects are on the young fish which remain in the upper reaches of the estuary until the fall when downstream movements begin. The low dissolved oxygen levels of July, August and September in the several miles of the Potomac below Key Bridge are often inadequate to permit survival of the young fish. Not only are most of the young spawned in the uppermost reaches of the estuary doomed by these conditions, but those hatched downstream in the general reach near Quantico tend to migrate upstream in late summer and thus are also threatened by the poor water quality in this area. Serious fish kills in which the adults of most species present are killed are not uncommon. For at least the last ten years, the Anacostia River has been totally eliminated as a spawning and rearing area for anadromous fish by pollution.

Dissolved oxygen levels should be maintained at not less than 5.0 mg/liter at all times if we are to insure that fishery resources of this reach are protected. Similarly, other parameters of water quality must be maintained at an acceptable level. These are spelled out in some detail in the National Technical Advisory Committee Report.

A parameter of water quality which is of major concern is that of temperature. More than any other single factor, temperature may control life in the aquatic environment. Aquatic organisms generally are adapted to a relatively narrow range of temperatures. Furthermore, water will hold less dissolved oxygen at high temperatures than it will at low temperatures, and biological organisms consume more oxygen at higher temperatures. Thus, any permitted increase in water temperatures can seriously aggravate the already monumental oxygen problems of the river.

The presently approved temperature criteria for the Potomac River in both the District of Columbia and Maryland water quality standards are less stringent than those recommended for such water uses in the National Technical Advisory Committee Report.

In March of 1968, the then Secretary of the Interior Stewart Udall, when testifying before the Subcommittee on Air and Water Pollution of the Senate Committee on Public Works, indicated a need and intent to reexamine certain of the water quality standards which he had approved prior to that time. Maryland was one of those States. It would appear desirable to critically review the temperature criteria of both the State of Maryland and the District of Columbia when this additional review is carried out.

While we have spoken here primarily of anadromous fish, the resident species, such as white and yellow perch, largemouth bass, sunfish of several species, catfish and others, have also been adversely affected by the present polluted conditions. An effective restoration of water quality in the Potomac will permit a recovery of the resident fish species as well as the anadromous ones. We have for the past many years foregone many hundres of thousands of man-days of sport fishing each year in the upper Potomac estuary because of the polluted condition of the river. This city needs this valuable recreational resource which can and will be available to all, once the quality of the river is restored. A level of quality is needed which is suitable not just for maintenance of fish life, but for propogation as well. This should include a control on coliform bacteria at a level which both protects the health of the recreationist and frees his mind of concern that the fish he catches may not be clean enough to use for food.

The achievement of the water quality now prescribed for the Potomac River in the water quality standards which have been approved will undoubtedly result in vastly increased human benefits arising from improved fishing and other recreational uses of the river; it will not provide the quality needed for good fishery habitat. The attainment of a minimum of not less than 3.0 mg/l of dissolved oxygen in the reach from Rochambeau Bridge to the Prince George's county line will require a serious and expensive effort on the part of the waste discharges. However, the optimum use of the estuary in line with the principles of multiple-use show the need for still higher levels of quality. As improved waste treatment technology is developed, these should be applied in order to attain the higher levels of quality needed for optimum public benefit from the river.

SECRETARY KLEIN: Are there any questions from the gentlemen on my left?

MR. JACKSON: Mr. Chairman?

SECRETARY KLEIN: Mr. Jackson.

MR. JACKSON: Dr. Barber, I wonder if you had an opportunity, say, in the last five to ten years to observe the shad runs at Chain Bridge, and whether you have any comment as to whether they diminished, increased or remained as they largely were? Do you have any comment on that?

DR. BARBER: I have not personally made observations in the Chain Bridge area, but I have talked with some of our task force people who were familiar with this area, and the general indication is that the shad runs in the Chain Bridge area have apparently been at a rather low level for quite some time.

MR. JACKSON: When you say "general indication", is this by actual sampling, or how do you go about getting a general indication of this sort of thing? I just ask for information.

DR. BARBER: Frankly, sir, I don't know what our people have done there. We have had observations a little bit up river at the Little Falls fishway, in which the indications are that the fish are no longer reaching that level in the river in recent years.

MR. JACKSON: I see. I have one further question.

At the bottom of page 6 of your statement, you state:

> "However, the optimum use of the estuary in line with the principles of multiple use show the need for still higher levels of quality."

Are you referring now to the 98 per cent reduction in bacterial count and the 96 per cent reduction? Is this the general area in which this report deals?

DR. BARBER: Well, I am speaking more in terms of maintaining minimum criteria which are essentially a good fishery habitat in this part of the estuary.

I suspect that every bit of this 96-98 per cent removal will be required in order to achieve a good level of habitat in that area.

MR. JACKSON: When you say you suspect, does this mean that you think we might even go to 100 per cent removal later on to get the kind of levels that would sustain, say, a medium fishing effort or good fishing effort?

DR. BARBER: I am not a sanitary engineer and I am not very knowledgeable in waste treatment techniques.

In discussing the water quality standards for this segment of the river, it has been my understanding that the sanitary engineers felt that the level of treatment proposed could not achieve a better standard than that, which would allow oxygen to reach a low of 3 milligrams per liter under critical conditions.

MR. JACKSON: Thank you very much.

SECRETARY KLEIN: The gentlemen on my right?

(No response)

SECRETARY KLEIN: Thank you very much, Dr. Barber.

DR. BARBER: You are very welcome.

SECRETARY KLEIN: Mr. Walter Scheiber, Executive Director, Metropolitan Washington Council of Governments, has submitted a letter. I do not think he is here.

Is Dr. Lentz here instead?

(No response)

SECRETARY KLEIN: This letter states that they wish to re-examine their position in the light of the last two days' testimony and conflict between different groups that they represent and come in with a further statement, at which time I will be glad to enter it into the record.

(The following documents were submitted for inclusion in the record:)

METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS

1225 Connecticut Avenue, N.W., Washington, D.C. 20036

4 April 1969

Honorable Carl L. Klein

Chairman

Potomac River - Washington Metropolitan Area Enforcement Conference

Washington, D.C.

Dear Mr. Klein:

The Metropolitan Council of Governments is keenly interested in the resolution of the problems of pollution of the Potomac River, and has long been involved in efforts to abate this pollution.

Because of this concern and involvement, and because the Council is the representative of the fifteen major local governments of the National Capital Region, it has been scheduled to present testimony before the Conference directed to the concerns which you and we share.

However, in the light of the testimony presented before you in the past two days the Council feels that it is desirable that it reappraise its position on the matter. This reconsideration is in part the result of an apparent lack of agreement among the members of the Council and its Regional Sanitary Advisory Board concerning the matters before the Conference.

The interest and involvement of the Council of Governments in problems of pollution of the River date back to 1957. In that year, members of the Council were instrumental in the opening up of the Dulles Interceptor Sewer to serve portions of Fairfax, Loudoun and Montgomery Counties, thus reducing local dependence on septic facilities. In 1958 the political leaders of the Council unanimously went on record with a so-called "no effluent" policy directed toward the prevention of sewage discharges into the River within the Metropolitan Area above the Little Falls Intake. This mandate has been fully honored since that time.

In 1962 the Council commissioned and received a comprehensive sewerage blueprint from Drs. Abel Wolman and John Geyer, which has since served as the basis for the construction of sewage treatment facilities throughout Metropolitan Washington. Within the past year, the Council has received additional reports prepared by a team chaired by Dr. Wolman directed to the water supply needs of Metropolitan Washington to the year 2010.

The Council is now in the final stages of preparing a master sewerage and water plan for the Metropolitan Area required under the terms of Federal legislation in order to maintain the eligibility of the Area's local and state governments and special agencies for Federal assistance in the construction of major facilities.

With your leave, it is the intention of the Council to submit a further statement based on a reappraisal of its position in the light of testimony and questioning at the Conference so that it may be considered by you and other parties. This statement will not only define the Council's position but will offer its continuing assistance and advice, as the official regional planning agency for Metropolitan Washington, in connection with the implementation of whatever recommendations are arrived at by the unanimous decision of the conferees.

In the meantime, we are pleased to submit to you two pieces of information requested by you at the outset of the Conference, one dealing with expenditures by local governments for water pollution control over the past ten years, and the other dealing with the degree to which sewerage user charges are in effect in this Metropolitan Area.

Your consideration of our interest is appreciated.

Very truly yours,

s/Walter A. Scheiber
Walter A. Scheiber
Executive Director

* * *

SUPPLEMENTARY STATEMENT OF
MR. JOHN J. LENTZ
DIRECTOR OF ENVIRONMENTAL HEALTH
METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS

At the April 2, 1969 session of the Conference on Pollution of the Potomac River-Washington Metropolitan Area, the Metropolitan Washington Council of Governments was requested to provide information on the rate of expenditures for water pollution abatement in the region in relation to the rate of expenditure for all governmental functions. The Council of Governments was also requested to furnish information on the extent to which sewer use charges were used as a basis for recovering costs of water pollution control activities.

In response to this request the following jurisdictions and agencies were contacted:

City of Alexandria;

Arlington County;

Fairfax County;

District of Columbia;

Alexandria Sanitation Authority;

Washington Suburban Sanitary Commission (serving Montgomery and Prince George's Counties)

Additional information was obtained from annual reports of several local jurisdictions and Statistics-Washington Metropolitan Area, a report of the Council of Governments.

Based upon data presented on pages 14 and 18 of Potomac River Water Quality the jurisdictions and agencies contacted and included in the following analysis are responsible for treating 99% of the influent BOD and 99% of the influent suspended solids from the Washington metropolitan area.

Total local expenditures by governmental agencies in the Washington metropolitan area are reported in Statistics--Washington Metropolitan Area. These expenditures are summarized and presented for the region in Table 1.

Costs for water pollution control expenditures were obtained from respective agencies and include operation and maintenance costs and debt service, as well as capital costs of non-bonded improvements. These costs are presented in Table 1.

Comparison of the costs in Table 1 indicates that for the last ten years, the expenditures for water pollution control activities have kept pace with total governmental expenditures for all purposes.

The same water pollution control agencies were contacted to determine to what extent sewer use charges were used as a basis for recovering water pollution control costs. Each of the control agencies queried indicated some form of assessment based upon estimated sewage contributions was used. Except for Fairfax County, these assessments are based upon water consumption. Fairfax County levies an annual charge for sewer service. The sewer use rate varied from about 15 cents to about 30 cents per 1,000 gallons of water used. The total revenue received from sewer use charges for FY 1968 was $17,500,000 or about 52 per cent of the total water pollution control expenditure of $33,400,000 for those agencies.

* * *

TABLE 1

WATER POLLUTION CONTROL
AND
TOTAL GOVERNMENTAL EXPENDITURES

WASHINGTON METROPOLITAN AREA
1959 - 1968

Year	Total Governmental Expenditures (1,000's of $)	Water Pollution Control Expenditures (1,000's of $)	W.P. Expenditures as % of Total Expenditures
1959	476,000 [1]	11,500 [3]	2.4
1960	505,000 [1]	13,500 [3]	2.7
1961	563,000 [1]	20,500 [3]	3.6
1962	626,000 [1]	20,200 [3]	3.2
1963	684,000 [1]	19,900 [3]	2.9
1964	734,000 [1]	22,800 [3]	3.1
1965	793,000 [1]	27,600 [3]	3.5
1966	863,000 [2]	25,500 [3]	3.0
1967	984,000 [2]	30,100 [3]	3.1
1968	1,049,000 [2]	33,400 [3]	3.2
10 Year Totals	7,277,000	225,000	3.1
1959-1963	2,854,000	85,600	3.0
1964-1968	4,423,000	139,400	3.2

1. From Statistics-Washington Metropolitan Area by Metropolitan Washington Council of Governments, 1968. Includes Montgomery Co., Prince George's Co., District of Columbia, Alexandria, Arlington Co., Fairfax Co., Falls Church, Loudoun Co., and Prince William Co.

2. Figures developed from recent annual expenditure reports of some jurisdictions listed under 1.

3. Include expenditures for operation and maintenance, debt service, and capital improvements of sewerage and treatment systems as reported by Washington Suburban Sanitary Commission, District of Columbia, Fairfax Co., Arlington Co., and Alexandria Sanitation Authority.

SECRETARY KLEIN: We have now Mr. Carl J. Johnson, who is the Executive Director of the Interstate Commission on the Potomac River Basin.

Mr. Johnson.

MR. JOHNSON: Mr. Chairman, I have two organizations that would like to present statements, and I believe we should get this out of the way before I present my statement.

Mr. Robert Bodine, Citizens Council for a Clean Potomac.

STATEMENT OF
MR. ROBERT N. BODINE, JR.
TREASURER
CITIZENS COUNCIL FOR A CLEAN POTOMAC

MR. BODINE: Mr. Chairman, conferees, ladies and gentlemen:

I am Robert N. Bodine, Jr., treasurer of the Citizens Council for a Clean Potomac. The Council is a basin-wide volunteer citizens organization dedicated to ending pollution of the Potomac River and its tributaries. It is further dedicated to aid in the conservation and development of the resources of the river, its tributaries and their valleys, and to assist in restoring the natural beauty of these waterways.

We would like to call your attention to a matter which has been of increasing concern to us within the past year. The Council is a participant in the litigation regarding the bulkheading and filling of certain submerged lands at the mouth of Hunting Creek. We are also concerned with the proposal that the District of Columbia sell a tract of marshland on the Potomac shore to Prince William County, Virginia, with a provision that the District could use the area for solid waste disposal. Only a few days ago we learned of plans to fill a reported 80 to 90 acres of marshland at the mouth of Oxon Run for a golf course.

We are informed that these fills received the approval of the United States Department of the Interior, at least in the cases of Hunting Creek and Oxon Run.

Solid waste disposal studies indicate many valuable marsh areas along the Potomac estuary may be used for sanitary landfills.

Mr. Chairman, the submerged shorelines and marshlands are a vital segment of any river system. Their ecological importance is a recognized fact. The proponents of landfills often attempt to convey the idea that marshlands are of value only to the starry-eyed waterfowl preservationists. We believe all the conferees here know that this is not true. These wetlands are, in fact, vital to the protection and maintenance of the total water resource.

The Citizens Council for a Clean Potomac respectfully submits that you should not sit here in this Conference making judgments and plans which may cost the people of this area two to three hundred million dollars for waste treatment without also making plans to prevent the river from being turned, by landfills, into a big ditch. We feel the people of Washington have no use for a coliform-free ditch.

We would appeal to the Secretary of the Interior to review Interior Department policies relating to this issue and we would recommend that State and local policymakers review their policies also.

We recognize that it may be necessary, for public purposes, to fill a small portion of the river system. However, we do not accept the conclusion that this privilege also extends to apartment house development, which is private profit at the public's expense, golf courses or other similar recreation developments. Indiscriminate landfills should not be permitted. Only those fills vital to the proper maintenance of the river should even be considered.

Thank you.

SECRETARY KLEIN: I will advise you that I will forward your letter under my letterhead to Secretary Hickel and ask for comments herein, and find out why, when and what have you, and I shall direct a letter back to you.

However, you have not said much about whether you think we should do anything about cleaning up the coliform in the river. If we don't do that, what good are your wetlands?

MR. BODINE: Sir, we simply wanted this in the record, which had not been brought up prior at the hearing. We have been in attendance, and I am delighted that we have a gentleman sitting as an Assistant Secretary bringing this to a focus as you are doing at this Conference, sir.

SECRETARY KLEIN: Well, you see, you are heading a Citizens Council for a Clean Potomac, and all I have heard thus far is you don't want certain landfills.

What is your position on the Potomac? This is what I would like to know.

MR. BODINE: The river quality itself, sir?

SECRETARY KLEIN: Yes.

MR. BODINE: At the present time, sir, I will say this: We received a copy of the blue-covered report Wednesday, the 29th of last month.

We are a basin wide organization. To get a consensus to stand up here and represent an organization--while it took a little bit of work, your blue report was a shock to me and it is a shock to everybody else. I mean, we had never expected to see this, sir.

We have no position. We are an organization.

I myself, I would quote one paragraph to you to describe what a shock it is to me from a letter Mr. Jensen sent to the County Executive of Fairfax County on September 19, 1968.

> "The Board of Supervisors of Fairfax County has brought up that the Oceoquan watershed attempted to take action to preserve this watershed for drinking use purposes. In the interim, until Mr. Paessler's

group completes its study by Dr. Clair Sawyer"--who spoke in here, and this is signed by Mr. Jensen--"we suggest that the Fairfax Board of Supervisors defer action on the motion until the study is completed."

I have heard you 20 times today say "no more studies", sir.

SECRETARY KLEIN: No, no. What I have been saying is let's do some action while we are studying.

MR. BODINE: I agree with you. That is what we answered, and yet Mr. Jensen's recommendation to the Board of Supervisors was to defer action.

I am merely pointing this out to say what a shock this blue report is to me and to the people that have seen it in my organization, sir.

We are not prepared to comment on it.

The question that you brought up here several times is how much is it going to cost me? I testified on the Alexandria stretch on setting the water standards. We were presented water standards and asked for public comment.

I remember making the comment, "Is it going to cost me and my family a new Cadillac each year or is it going to cost me two cents?"

I have sat here. I haven't heard an answer yet from any of the sanitary engineers as to what it is going to cost me. I sat here jotting down figures.

Mr Hale uses a range for Fairfax County to implement the blue book from 1.4 million to $750,000 a year. Let's just take a $1 million round figure.

He says he has 33,000 customers. He says he has 3.7 people per family. Actually, and it makes very simple arithmetic, 3.3 persons per customer, so that makes 100,000 customers. 100,000 into $1 million is $10 per year. That is less than $1 a month, not $4 a month.

SECRETARY KLEIN: We were figuring $1 per month increase with $3 to start with, and a total of $4.

MR. BODINE: All right.

Mr. Jensen asked how much a swimming club costs.

I belong to a very, very moderate Fairfax County swimming pool. I have $300 invested as an initiation fee, which I can recover. It is $21 plus a $50 a year service charge which is $71 a year, sir, and there are many that cost twice as much.

I am comparing a $10 a year increment to $71 a year.

I will go for a clean river.

SECRETARY KLEIN: Thank you. Any questions?

MR. JACKSON: Mr. Chairman?

SECRETARY KLEIN: Yes.

MR. JACKSON: I would like to cite one of the conflicting uses of the river which has been referred to.

If we are to expand our water pollution control plant to the extent that will be necessary to treat the wastes, we are going to have to add, and I think I referred to this in my statement, and we are going to have to ask to be allowed to dredge 51 acres to try to increase this for bettering the water quality that we release to the river.

I would like to ask Mr. Bodine if he considers this one of the vital aspects necessary to the maintenance of the river?

MR. BODINE: Mr. Jackson, definitely yes. If you can make a land switch with the Government plans at Anacostia and Bolling--I know you are bounded on the north with a naval research laboratory and I know they have no excess lands, but if for $25,000 or $50,000 extra piping you can get the land from Bolling, we would prefer this.

Our remarks were not directed to the 50-plus acres for the Blue Plains plant. They were directed to recreation, golf courses, and so forth.

MR. JACKSON: This brings us to another conflicting interest, and, Mr. Chairman, if I may divert from liquid wastes to solids for just a moment?

SECRETARY KLEIN: They are all, I think, part of the projected problem. We get into water, air and solids, although they are split up in different functions of the government, but sooner or later they all touch.

MR. JACKSON: We are getting into an environmental situation, and one of the big pressures is to try to create recreational land as a result of disposal of solid wastes.

I am not sure what particular project you are referring to, but I just want to cite the fact that we are trying to get rid of solid wastes in the District of Columbia along this line, namely, that we think Uncle Sam has got a landfill, and even consider it from the standpoint of a golf course to make a better use of the land, and if we can build golf courses up to a higher elevation and get rid of more solid wastes, then this in a sense is also functioning for a better environment in which we live.

So, you may not be referring to the same situation that I am, but I am referring to this plan for a golf course in the vicinity of Oxon Run.

To me, this served a dual purpose. It helped the City get rid of its wastes--and Iwant to point out that our water carried waste systems are not going to disappear tomorrow at the rate at which we are throwing away trash. It is not going to disappear tomorrow. Cities do have a problem to get rid of it.

We have to keep this in mind: That not only are studies necessary, but we have to take care of the everyday housekeeping needs as well.

Mr. Chairman, I thought I would just mention that because we do have this problem, and the District is faced with the problem now because it has to put outside of the district some of these that you just mentioned in your statement, Mr. Bodine, which concerns an area in Prince William County, and this is simply a method to try to conduct a reasonably good sanitary land operation to take care of a very vital necessity.

Thank you, Mr. Chairman. I just wanted to mention that.

MR. BODINE: Mr. Chairman, might I just respond to that as an individual?

SECRETARY KLEIN: Yes.

MR. BODINE: Let us say that by some miracle and certainly that within ten years we achieve a 99 per cent removal of all the deleterious substances from our municipal wastes.

Let us also say that the Hammer, Greene, Siler report becomes true in the year 2000.

Now, two-tenths pounds per person of BOD per day, 7 million people, and one per cent of this.

Though Secretary Klein has said he wants to get rid of the thought that the estuary must be an assimilation base, it will always be an assimilation base, and we have a God-given resource which you can go back to George Washington's time with. Haines Point is filled up.

My second job was timekeeper on filling Gravely Airport. My first one was in Arlington Cemetery, where I will probably be very soon, and time has gone on, and these wetlands and these shores had to be filled.

You remember the malarial problems earlier in Washington.

SECRETARY KLEIN: You are going to try to keep this short, please?

MR. BODINE: Each acre of that water is a natural resource to assimilate the material which we will not be able to purify, and each acre we lose, we cannot replace.

I know I personally will fight for each acre of that shore to remain wet.

Thank you.

SECRETARY KLEIN: If I may say, the whole problem arises here is that too many people--and I have said it before--too many industries, too much use of water, and mankind has changed his entire environment around and the condition is how do we put some of it back into a semblance of shape so that we can continue using it, because otherwise we are going to be short on a water supply somewhere along the line, just like the arid southwest is. And that is the problem that pollution leads to, a shortage of water supply.

MR. McKEE: Mr. Chairman?

SECRETARY KLEIN: Yes?

MR. McKEE: Just a brief comment to Mr. Bodine.

All landfills in the Potomac River or tributaries requires a permit from the Maryland Department of Water Resources.

All applications to the Corps of Engineers are reviewed by the Maryland Board of Public Works prior to issuance or approval by the Corps of Engineers.

The Maryland Department of Water Resources Law requires a public hearing for each of these permits prior to issuance.

There are some controls in Maryland.

SECRETARY KLEIN: I took that for granted, too, and I took it for granted that there was public approval on all of them, because I have seen this in the past, and I think it is pretty well the case all over the United States of America. Mr. Johnson?

MR. JOHNSON: We now have Mr. Morris. I believe Mr. Morris represents the Interfederation Council. If I am not correct, Mr. Morris, you correct me. You correct me if I am wrong.

STATEMENT OF
MR. JONAS MORRIS
CITIZENS PERMANENT CONFERENCE ON THE POTOMAC RIVER BASIN

MR. MORRIS: Mr. Chairman, members of the Conference:

My name is Jonas Morris, and I am appearing today as representative of the Citizens Permanent

Conference on the Potomac River Basin.

It is indeed a pleasure to appear before you to participate in this Conference on the Pollution of the Potomac River--Washington Metropolitan Area.

I am familiar with the recent report of Secretary Hickel--Potomac River Quality--Washington D.C. Metropolitan Area--and on behalf of Citpercon I can state that we thoroughly endorse its recommendations for the elimination of pollution in the Potomac River.

The primary problem regarding Washington water is, of course, improving the quality of the water in the Potomac River, and particularly in the estuary.

A related and also very pressing problem is the need to create a supplemental supply of water for the Washington Metropolitan area during periods of low flow in the River.

Citpercon is an organization whose main objective is to stimulate the development of a practical and desirable supplemental water supply. Citpercon is a non-profit organization made up of individuals from throughout the entire basin.

My purpose for appearing before you today is to formally present to the Conference a report by

Ellery R. Fosdick entitled, "The Potomac River Estuary--A Supplemental Source of Municipal Water for the Washington Metropolitan Region." Mr. Fosdick is a consulting engineer to the National Parks Association and to Citpercon. The report was prepared in January 1968 under the auspices of the National Parks Association.

The Fosdick report demonstrates the desirability and practicability of using the water of the upper estuary for supplemental supply during periods of low River flow. The proposal is not universally accepted. However, I want to point out to the Conference certain elements in the report, and present other comments that support the contention that supplementary water needed for the Washington Metropolitan area can be taken out of the estuary.

The estuarial pumping plant I am speaking of probably should be located on land now owned by the Federal Government between the C & O Canal and the Potomac River, about 13,000 feet downstream from the Little Falls Pumping Plant, in the vicinity of Fletcher's Boathouse. There appears to be sufficient space for the pumping plant at this location, and the Potomac River channel starts to widen and deepen there, making it suitable for a forebay. After being pumped from the estuary, the water would be treated in conventional manner and put into the area's water supply system.

The construction of this pumping plant would be carried out in two stages. The estimated cost of the first stage is $4.7 million, and of the second stage $4 million, for a total cost of $8.7 million. This would be but a fraction of the cost of $393 million, at 1962 prices, that would be required to construct the sixteen large dams and reservoirs that have been proposed by the Army Corps of Engineers to augment the low flow in the Potomac River.

The amount of fresh water and natural storage of the Potomac River at low tide, between Little Falls and Indian Head is about 13 billion cubic feet, or 100 billion gallons. The U. S. Geological Survey Circular 529A states, and I quote:

> "In the upper reaches of the estuary the water quality is satisfactory for most uses after standard treatment to sterilize, being about the same as the quality of the Metropolitan intake at Little Falls."

The October 1, 1968 report of the Secretary of the Interior--"The Nation's River"--also recognized the importance of the estuary for water supply purposes. It points out that the upper Potomac estuary, from Little Falls down to the vicinity of Marshall Hall and Mount Vernon contains a great deal of fresh water, although heavily polluted. The report adds that this water constitutes "a large natural reservoir, potentially usable municipal and industrial water, whose attractiveness for these purposes, as well as for others, will grow steadily as the pollution is brought under better and better control."

While the report stops short of saying that it can be national policy to rely on the estuarial reservoir, it does point out:

> "That in the long run, the major part of the fresh water tidal river at or below Washington is likely to be a valuable source of metropolitan water, maybe the principal source, is quite possible. Its use is and will be a strong consideration in long-term planning."

It goes on to say:

> "...but the truth is that right now enough doubt and ignorance exists in regard to its exact potentiality that it (the estuary) should not be

> counted on to provide a safe margin of supply under all conceivable conditions during the next twenty years or so, for which planning provisions need to be more rigid and definite. The doubts and unknown factors have to do mainly with the quality of this water. Use of this water for periods beyond a few days of emergency use would become essentially a form of recirculation of waste waters."

The point is that low quality water stands in the way of taking advantage of the estuarial reservoir. Citpercon maintains that the quality of the water in the estuary near the proposed intake is adequate--with proper treatment--at the present time for use in the main water supply system. And I remind you of the Geological Survey Circular 529A. Nevertheless, I hasten to add that Citpercon stands full-square with the chorus calling for improved water quality in the Potomac River.

What is more, the $393 million that would be saved by not constructing any Corps impoundments in the Basin could be advantageously used to improve treatment of effluent now being put into the Potomac.

We believe the Fosdick report fully resolves any "doubts and unknown factors" and expresses quite clearly the feasibility and desirability of using the water from the upper estuary. Prompt implementation of the proposal would demonstrate its value.

We urge the Conference to give the Fosdick report close examination.

Thank you.

* * *

(The following document was submitted by Mr. Morris for inclusion in the record.)

THE POTOMAC RIVER ESTUARY

As a Supplemental Source of Municipal Water for the Washington Metropolitan Region

By ELLERY R. FOSDICK

Consulting Engineer, National Parks Association

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This study summarizes, for public information, examination, and criticism, the results of investigations made into a significant social issue in the objective and impartial spirit of the scientific method. The express and implied goal-values involved, inevitably involving intangibles, are considered to be open to examination and criticism on an equal footing with tangible and measurable elements. Copies are available for free distribution in reasonable quantities at the National Parks Association, 1701 18th Street, N.W., Washington, D.C. 20009.

THE POTOMAC RIVER ESTUARY
As a Supplemental Source of Municipal Water for the Washington Metropolitan Region

By Ellery R. Fosdick
Consulting Engineer

NATIONAL PARKS ASSOCIATION
Washington, D.C.
January 1968

1. *Introduction*

A CONTINUING ADEQUATE SUPPLY of municipal water for the Washington Metropolitan Region has been the major objective of water resource planning in the Potomac River Basin for a number of years. This concern for adequacy of the municipal water supply required by the largest concentration of population in the Basin, which also includes the Nation's Capital, is, of course, understandable.

Water resource planning in the past would have resulted in a major expenditure for augmenting the low flow of the Potomac River to dilute pollutants that are present in the stream and its Estuary, rather than in spending primarily to provide more water for municipal purposes in the Washington Metropolitan Region during the short time needed in the summer of years when the flow of the river is low. The need for pollution abatement by low-flow augmentation will, however, be reduced or perhaps eliminated in both the river and its tidal estuary in the foreseeable future under the Federal Water Pollution Control Act.

The adverse effect of the large dams and reservoirs proposed to accomplish low-flow augmentation on the environment of the Basin seems to have been largely ignored, so far, in the planning. The economic feasibility of the dam and reservoir projects proposed for construction has been demonstrated by means of the conventional benefit-cost ratio. In doing this, no allowance has apparently been made for intangible factors such as adverse effects of the projects upon the ecology of the Basin, which may be of equal or greater importance than the economics of the proposals. This procedure is not in accord with the basic environmental goals of man today, as he seeks a quality of environment in which he is in harmony with both neighbors and natural surroundings.

An adequate study is needed of alternate ways of supplying the future municipal water requirements of the Washington Metropolitan Region during occasional low-flow periods; ways which would not have an adverse effect upon the natural environment of the Potomac River Basin. Among these alternatives are the use of water from the Estuary; re-use of waste water; release, when needed, of stored water from small headwater reservoirs; and the transportation of water to the Washington Metropolitan Region from other river basins in the area. One of the alternatives offering good possibilities, reported upon herein, is the use of fresh water held in natural storage by the Potomac River Estuary.

2. *General*

A preliminary study has been made of the technical and economic feasibility of using fresh water (not salt) found in natural storage in the Potomac River Estuary to supply the emergency requirements of the Washington Metropolitan Region (hereinafter called the Region) for municipal water that arise during low flow periods of the river. This study is primarily for the purpose of indicating whether use of water from the Estuary for this purpose has sufficient merit to subsequently justify a complete feasibility study by a Government agency or a firm of consulting engineers.

In this study the maximum use possible has been made of information already available, so as to keep the volume of work at a minimum. Information has been obtained from the United States Geological Survey on the discharge of the Potomac River near Washington, D.C., on diversions from the river, and on the amount of fresh water available in the Estuary. Data on population in the Region has been obtained from the United States Bureau of the Census. Information was obtained from representatives of the various water systems operating in the Region regarding their sources of water, capacities and future requirements. Annual reports were obtained from the District of Columbia Government and Washington Suburban Sanitary Commission for use in preparing this report. Information was also obtained regarding the cost of large water pipe and big pumps from suppliers and from the local electric utility concerning the cost of electric power. A list of reports and other material used in making this study is included herein.

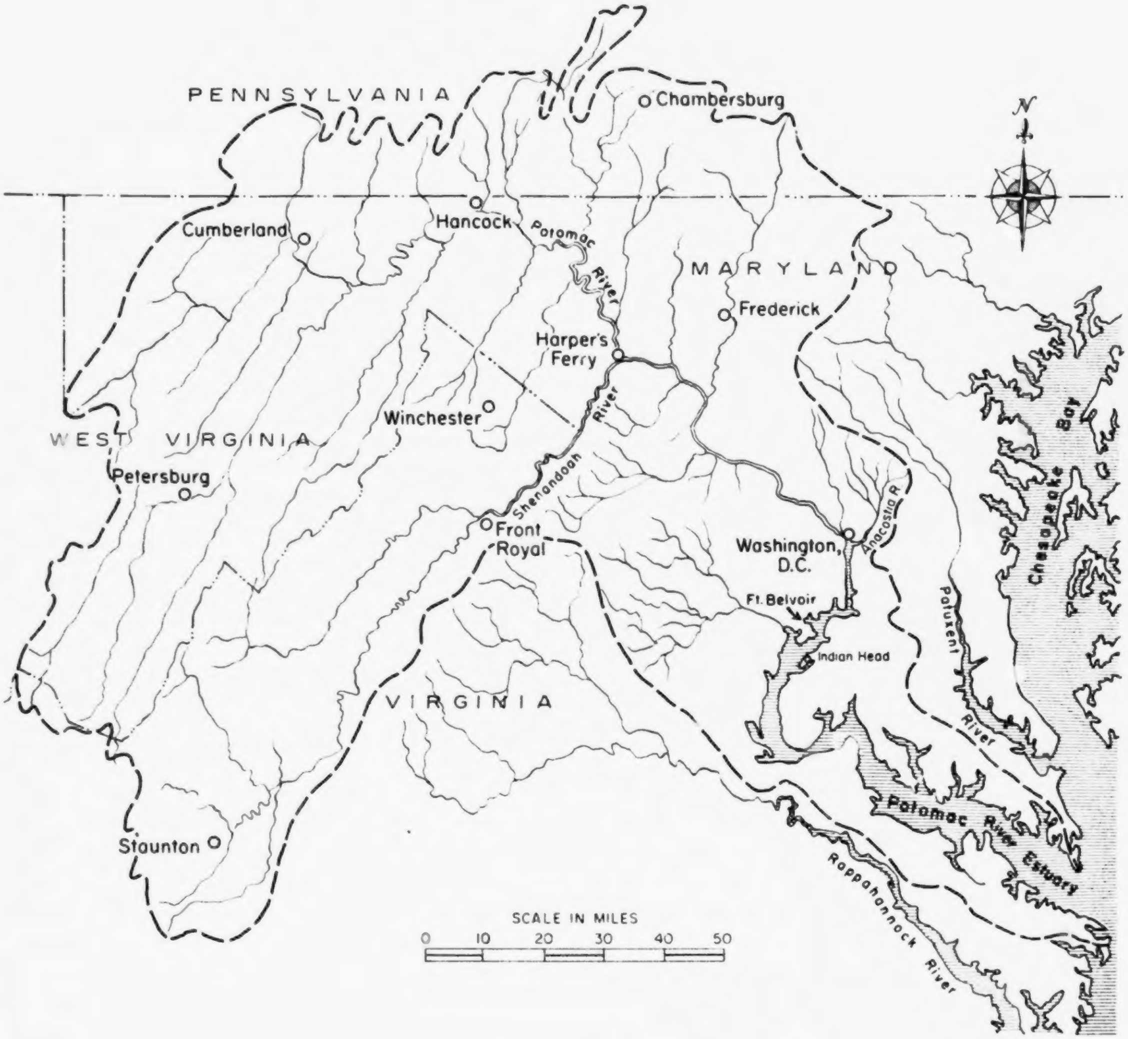
PENNSYLVANIA
Chambersburg
Cumberland
Hancock
Potomac River
MARYLAND
Frederick
Harper's Ferry
Winchester
WEST VIRGINIA
Petersburg
Shenandoah River
Front Royal
Washington, D.C.
Anacostia R.
Ft. Belvoir
Indian Head
Patuxent River
Chesapeake Bay
VIRGINIA
Potomac River Estuary
Rappahannock River
Staunton
SCALE IN MILES
0 10 20 30 40 50
N

Figure 1

Potomac River Basin, Estuary and Adjoining Areas

There seems to be no doubt that the Potomac River Estuary contains an adequate amount of fresh water to supply all of the emergency requirements of the Region for municipal water that will arise during the low flow periods of the river in the period studied herein. The Estuary twists and turns for 117 miles from the head of tidewater at Little Falls near Washington, D.C. to the Chesapeake Bay, as may be seen in Figure 1, opposite. The body of fresh water extends downstream from Little Falls for over 24 miles to a brackish-water front located below Fort Belvoir, Virginia, near Indian Head, Maryland.

The amount of fresh water in natural storage in the Potomac River at low tide between Little Falls and Indian Head is about 13 billion cubic feet (100 billion gallons) according to United States Geological Survey Water Supply Paper 1586-A. In United States Geological Survey Circular 529-A it is stated that "Although the ocean tides reach to Chain Bridge, the ocean salt water does not extend beyond Indian Head." In the same publication it is stated that "In the upper reaches of the estuary the water quality is satisfactory for most uses after standard treatment to sterilize, being about the same as the quality at the Metropolitan intake at Little Falls. Downstream from Chain Bridge to the vicinity of Fort Washington and Mount Vernon, the dissolved oxygen decreases and the bacterial content of the water increases."

The suitability of estuary water for use in municipal water systems of the Region will be discussed subsequently, as will the method of supplying this water to the systems that will need it, and the cost thereof.

The concern of the Region about its municipal water supply does not seem to be wholly justified. The Region lies on both sides of the lower Potomac River which has a relatively large discharge near Washington, D.C., available for municipal water during much of every year. The Region also lies on both sides of the upper part of the Estuary, holding a large amount of fresh water in natural storage that can be used to augment the municipal water supply when the river is low. In reality the concern seems to be more over whether adequate clean, potable water, suitable for municipal use after a minimum of purification treatment, will be available. This is an unrealistic objective, since almost all municipal water used in the United States today must be treated as a large part of it has already been used at least once.

The incongruity is heightened when it is noted that the discharge of the Potomac River near Washington, D.C., which now supplies a major part of the municipal water for the Region, will continue to be more than adequate for the municipal water requirements at all times for many years into the future under the worst drought recorded to date, except for a period of about three months during the summer when additional water will be needed. The incongruity is further magnified by the fact that the fresh water in natural storage in the Estuary is largely composed of the same kind of water which is now used for a major part of the municipal water supply of the region.

3. *Summary of the Most Pertinent Facts Contained in this Report*

1. The upper 24 miles of the 117-mile-long Estuary of the Potomac River, a considerable part of which is located within the Washington Metropolitan Region, contains all fresh water (not salt) with over 100 billion gallons held in natural storage.

2. The fresh water in the upper Estuary, most of which is supplied by the discharge of the Potomac River, is of good quality, and part of it is now diverted near Washington, D.C. before it reaches the Estuary to supply a major portion of the municipal water requirements of the Washington Metropolitan Region.

3. The discharge of the Potomac River into the Estuary is sufficiently large during every year so that the upper Estuary is thoroughly flushed several times.

4. The quality of the Potomac River water after it reaches the upper Estuary is lowered because of pollutants entering from the Washington Metropolitan Region, chiefly from the Blue Plains Waste Water Treatment Plant of the District of Columbia.

5. The pollution entering the upper Estuary will have to be reduced under the Federal Water Pollution Control Act, and steps are now being taken to accomplish this by improving the treatment of waste waters, chiefly by well-known conventional processes. Studies are also under way to determine how best to eliminate pollution from storm waters, boats and ships, and dredging operations. An improvement in the quality of the water in the upper Estuary will have a beneficial effect upon the ecology of the Washington Metropolitan Region.

6. The maximum demand for municipal water in the Washington Metropolitan Region will increase over 3 times, from 0.5 billion gallons a day in 1970 to 1.6 billion gallons a day by the year 2010, the latest year studied, as will the annual requirement for water because of the expected growth in population and greater per capita usage of water.

7. A major portion of the municipal water requirement of the Washington Metropolitan Region must continue to be supplied from the Potomac River, as no other source is available, and additional amounts needed in the future, in excess of the unregulated flow of the river during occasional low-flow periods, could be supplied from the fresh water in natural storage in the upper Estuary. This would eliminate need for regulation of the river by large dams and reservoirs for municipal water supply.

8. The 100 billion gallons of fresh water in the Estuary is more than adequate to meet the forecast net requirement of 38.7 billion gallons for supplemental water during the low-flow months of July and August, under low-flow conditions if they occur in the year 2010. Smaller quantities of supplemental water would be required in prior years in the low-flow season, if low-flow conditions occur starting soon after 1970 and continue thereafter.

9. The need for supplemental water is highly variable and uncertain based upon past experience, there being only a 9 percent probability that such water will be needed in the year 2010. It is likely that no supplemental water at all will be needed in 27 of the 40 years from 1970 to 2010. This makes it difficult to justify a large expenditure to supply water for this purpose.

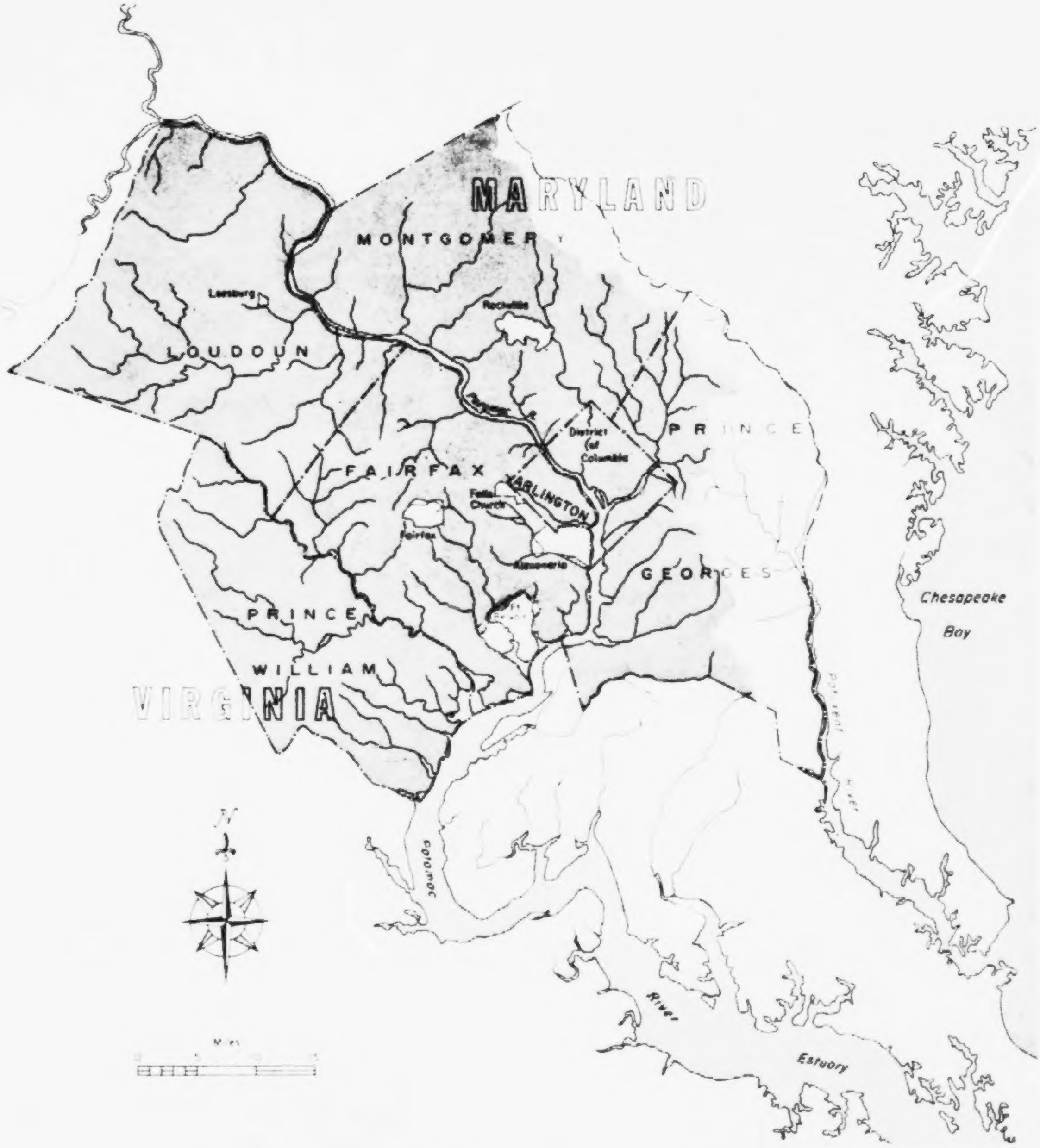
MARYLAND
MONTGOMERY
Leesburg
Rockville
LOUDOUN
District of Columbia
PRINCE
GEORGES
FAIRFAX
ARLINGTON
Falls Church
Fairfax
Alexandria
PRINCE
WILLIAM
VIRGINIA
Chesapeake
Bay
Patuxent River
Potomac
River
Estuary
N
Miles

Figure 2

WASHINGTON METROPOLITAN REGION

10. Supplemental water will in the future be needed from the upper Estuary by the Washington Aqueduct water collection and treatment system if the Potomac River remains unregulated. This system supplies a major part of the municipal water used in the Washington Metropolitan Region, all of which is distributed by other systems. Supplemental water from the Estuary will also be needed by the Washington Suburban Sanitary Commission operating in Montgomery and Prince George's Counties in Maryland, and by the City of Alexandria, Virginia.

11. Supplemental water would be taken from the upper Estuary by each of these agencies needing it using pumping plants located at suitable places.

12. The pumping plant for the Washington Aqueduct is reported upon herein as it would be an added expense since it would be constructed only if the Potomac River remains unregulated. A pumping plant for the Washington Suburban Sanitary Commission would have to be constructed in any event, either on the Estuary, if the river remains unregulated, or on the Potomac River if the river is regulated. If the City of Alexandria does not get additional water from a pumping plant on the upper Estuary, it will probably have to spend an equivalent amount in making arrangements to get water from some other source.

13. The pumping plant on the Estuary for the Washington Aqueduct should be put into operation by about 1970, or soon thereafter, as low-cost insurance against a possible shortage of municipal water.

14. The initial capacity of the Washington Aqueduct Pumping Plant should be 400 million gallons a day to take advantage of lower costs with large size, although this capacity will not be fully used for over 20 years; at that time an additional 400 million gallons a day of capacity should be installed. This capacity allows for a minimum flow from Great Falls to the Estuary of 100 million gallons a day, the all-time minimum flow that occurred over Little Falls in 1966. This flow down the river channel is considered necessary to avoid an adverse effect upon the ecology of the area.

15. The cost to construct Phase 1 of the pumping plant of the Washington Aqueduct with a capacity of 400 million gallons a day is estimated at $4.7 million. The cost to construct Phase 2, with an additional 400 million gallons a day of capacity, is $4.0 million. This is but a fraction of the cost of $393.3 million (1962 prices) for the 16 major dams and reservoirs that had been proposed to regulate the flow of the Potomac River, with their adverse effect upon the ecology of the Potomac River Basin.

16. The total annual cost for the pumping plant of the Washington Aqueduct in low-water years will increase from $379 thousand in 1970 and 1980 to $544 thousand by 2010, as the amount of electric power used for pumping becomes greater. This is but a fraction of the $20.8 million average annual cost for the 16 major dams and reservoirs that have been proposed.

17. The brackish-water front in the upper Estuary will not move upstream when water is pumped from the upper Estuary for municipal use, because the volume of waste water returned will be greater. This is so because the waste water includes a major portion of the water pumped from the Estuary, together with water imported into the Potomac River Basin from the Patuxent River Basin and a relatively small amount of water from other sources.

4. Areas Included in the Washington Metropolitan Region

The areas included in the Region, consisting of the District of Columbia and its environs, shown in Figure 2 opposite, are listed below and the agency supplying the water is indicated in each case.

District of Columbia	Municipal (a)	
Maryland	Montgomery County	Washington Suburban Sanitary Commission Partly from (a)
	Prince George's County	
	Rockville	Municipal
Virginia	Alexandria	Fairfax Water Authority
	Fairfax County	
	Fairfax City	Municipal
	Falls Church	Municipal (a)
	Arlington County	Arlington County (a)
	Leesburg	Municipal
	Loudoun County	Partly from (b)
	Prince William County	Partly from (b)

The method of supplying the municipal water requirements to each of the water systems in the Region—but not its distribution to individual customers—has been studied. A description of the present sources of supply for each agency providing water, and the plans for future expansion of these facilities, are given below.

The *Washington Aqueduct*, which gets all of its water from the Potomac River, treats this water at the Dalecarlia and McMillan Filter Plants before it is delivered to the District of Columbia Department of Sanitary Engineering for distribution to customers. Water is taken from the Potomac River at Great Falls and at Little Falls, located about 9 river miles and 1 mile, respectively, upstream from the District of Columbia.

Water flows by gravity from the intake at Great Falls through two conduits with a combined capacity of about 233 million gallons a day (mgd) to the Dalecarlia Filter Plant in Northwest Washington, from whence part of it is piped to the McMillan Filter Plant located near the center of the District of Columbia. Water taken at Little Falls is pumped by the Little Falls Pumping Plant, with a capacity of 450 mgd, to the Dalecarlia Filter Plant a short distance away. In addition, a hydroelectric station can be operated in emergencies to pump 120 mgd of water from the C & O

(a) Water supplied at wholesale by the Washington Aqueduct.

(b) Water supply by small municipal and individual water systems.

Canal at a point 1 mile downstream from Little Falls to the Dalecarlia Filter Plant.

Additional water required by the Washington Aqueduct in the future will have to be supplied from the Potomac River or its Estuary, as there is no other source of water readily available.

The *Washington Suburban Sanitary Commission*, which supplies water to Montgomery and Prince George's Counties in Maryland, obtains its water from the Patuxent River, Potomac River, from several wells located in Prince George's County, and from the Washington Aqueduct. Patuxent River water is stored for delayed use in the Triadelphia and Rocky Gorge reservoirs with a total capacity of 14 billion gallons (bg). Water from the Patuxent River is pumped by a pumping plant with a capacity of 65 mgd located at Rocky Gorge to a filter plant near Laurel, Maryland.

Potomac River water is pumped from the river by a pumping plant with a capacity of 70 mgd located on the bank of the Potomac River near the point at which Watts Branch empties into the river about 7 miles above Great Falls. This water is treated at a filter plant located near the pumping plant. There is no provision for storing water in the Potomac River at this point for delayed delivery to the pumping plant.

Additional water required by the Washington Suburban Sanitary Commission in the future will have to be supplied from the Potomac River or its Estuary, as there is no other source of water readily available.

The *Rockville, Maryland, Municipal Water System* gets all its water from the Potomac River by means of a pumping plant with a capacity of 8 mgd, located on the bank of the Potomac River near the point at which Watts Branch empties into the river. The water is treated at a filter plant located near Rockville, Maryland, about 6 miles from the Potomac River.

Additional water required by Rockville in the future will have to be supplied from the Potomac River or obtained from the Washington Suburban Sanitary Commission, which supplies water to the surrounding areas, as there is no other source of water readily available.

The *Fairfax County, Virginia, Water Authority* supplies water to small groups of customers in the county that would not otherwise be served, and operates the water system in the City of Alexandria. The communities of Falls Church, Vienna, and Fairfax City, located in the county, each has its own water system.

The authority purchases all of its water from Falls Church and Vienna and the Alexandria Water System except for about 15 percent that is obtained from wells.

Additional water required will probably continue to be obtained from these same sources unless it is purchased directly from the Washington Aqueduct as no other source of water is readily available.

The *Community of Falls Church* gets all of its water from the Washington Aqueduct. Additional water required in the future will probably also have to be obtained from the Washington Aqueduct.

The *Alexandria City Water System* gets its water from Occoquan Creek. Two pipelines with a combined capacity of about 150 mgd bring water from a 10 bg reservoir on Occoquan Creek to the city. The capacity of the reservoir can be increased to about 13 bg by raising the dam 5 feet. This would make it possible to supply the requirements of the city to about the year 2000.

Additional water required in the future by the City of Alexandria over that available from Occoquan Creek will probably have to be supplied from the Potomac River or its Estuary either directly or by purchasing it from an agency that gets water from these sources as there is no other source of water readily available. The nearest other large source of water is in the Rappahannock River located about 50 miles to the southwest.

The *Fairfax City, Virginia, Municipal Water System* gets all of its water from Goose Creek by means of a 22-mile pipeline from a reservoir with a capacity of 350 million gallons (mg). The water is treated in a plant located at Goose Creek.

Additional water required in the future by Fairfax City will be obtained by constructing a new dam and reservoir on a tributary of Goose Creek with a storage capacity of 2.5 bg, that will supply the requirements beyond the year 2010. The construction of this reservoir will not materially reduce the low flow of the Potomac River into which Goose Creek discharges at a point several miles above Great Falls, as most of the water will, during the low-flow period, be supplied to Fairfax City from the reservoir, since the flow of Goose Creek at that time will be quite low.

Arlington County, Virginia, gets all its municipal water from the Washington Aqueduct.

Additional water required in the future by Arlington County will have to be supplied by the Potomac River or its Estuary, as there is no other source of water readily available. This water will probably continue to be obtained from the Washington Aqueduct.

The *City of Leesburg, Virginia, Municipal Water System* gets all its water from wells and a spring. These have a maximum combined capacity of about 1.5 mgd.

Additional water required in the future by the City of Leesburg will have to be obtained from the Potomac River 3 miles away, as there is no other source of water readily available.

The portions of *Loudoun* and *Prince William Counties, Virginia*, that are located in the Region are presently supplied with water by small municipal and individual water systems.

Additional water required in the future by the increased population, after water systems start serving the area, will have to be obtained directly from the Potomac River or its Estuary, or indirectly by purchasing water from an agency that gets its water from those same sources, as there is no other source of water readily available. The nearest other large source of water is in the Rappahannock River Basin, located about 50 miles to the south.

5. *Future Requirements for Municipal Water in the Washington Metropolitan Region*

The average and maximum daily requirement for municipal water in the Region has been determined for 1970 and for each tenth year thereafter through the year 2010. These are as follows:

	Millions of Gallons	
Year	Average Day	Maximum Day
1970	338	483
1980	477	675
1990	674	902
2000	947	1,211
2010	1,282	1,616

The forecast of the average daily requirement has been computed from forecasts of population to be served water, and the expected average per capita use of water. The average daily requirement is needed to determine the total forecast annual and monthly requirements, in order to arrive at the amount of water needed in excess of the ultimate capacity of existing sources. This excess can be supplied from water found in the Estuary.

The forecast of the maximum daily use of water has been computed from the average daily requirements. The maximum daily use has been forecast for use in determining the amount of pumping capacity, in excess of the ultimate capacity of existing sources, which must be installed to take water from the Estuary.

The forecasts have been made starting with the actual population served, and its usage of water in 1966, in the areas supplied by the Washington Aqueduct, Washington Suburban Sanitary Commission, Alexandria, Leesburg, Fairfax City, and Rockville. The usage of water by the other areas was estimated from population and other information. This was considered to be satisfactory for the purpose of this report, since the other areas used only 4 percent of the water required by the Region in 1966, and they will take only 1 percent by the year 2010.

An increase of 2⅛ percent a year in the population in the Region to be served water in the future, used in making this forecast, is slightly less than the 2¼ percent increase experienced during the 5 years from 1960 through 1965, as this rapid rate of increase is not expected to continue far into the future. The rate of increase used in making the forecast is, however, considerably higher than the rate of about 1½ percent for the entire United States, and reflects the rapid growth in population that is expected in the Region in the future, particularly in areas outside the District of Columbia.

An increase in the average daily per capita use of water of 1½ percent per year has been used in making this forecast. This is the rate at which usage in the areas outside the District of Columbia has been increasing since 1958. It reflects the change in character of these areas that has occurred and is expected to continue as the suburban and urban population increases. The average daily per capita usage of water has, however, been limited to a maximum of 250 gallons, as it is expected to level at or below this amount.

The average daily per capita usage of water used in the forecast is considered to be the maximum that can be expected. This usage could probably be reduced by initiating measures for the conservation of water. These measures might include, but need not be limited to, the re[illegible]ng of soapy water from automatic washers, installation of toilets which use less water or no water at all, greater use of showers for personal bathing, reduction in the leakage from water systems, and the establishment of regressive-type rate schedules for water that will discourage waste by consumers.

The maximum daily use of water per capita in the Region as a whole has been gradually increased in the forecast from 184 gallons actually used in 1966 to 280 gallons in the year 2010. This increase follows the increase in the average daily per capita usage, but at a declining rate and reflects the change in use that is expected to accompany the changing character of the Region.

6. Requirements for Municipal Water from the Potomac River and Its Estuary

The amount of water needed for municipal use that will have to be taken from the Potomac River and its Estuary and supplied by other sources to meet the requirements of the Region on the maximum day in 1970 and for each tenth year thereafter through the year 2010 has been determined as follows:

	Millions of Gallons Per Day		
Year	Potomac River & Estuary	Other Sources	Total
1970	343	140	483
1980	512	163	675
1990	710	192	902
2000	981	230	1,211
2010	1,364	252	1,616

The other sources of water referred to above are the Patuxent River, Occoquan Creek Storage, Goose Creek Storage, and other small streams and wells. These sources would supply 29 percent of the requirements on a maximum day in 1970 and 16 percent in 2010. The amount of water that would be supplied from each source in each of the years studied is shown in Table 1.

Table 1

DEMAND FOR MUNICIPAL WATER IN THE WASHINGTON METROPOLITAN REGION ON THE MAXIMUM DAY

1970-2010 Inclusive

	Million Gallons Per Day				
	1970	1980	1990	2000	2010
Potomac River and Estuary					
Washington Aqueduct	286	356	455	608	807
Washington Suburban Sanitary Commission	57	148	243	357	498
City of Alexandria	—			—	36
City of Rockville	4.6	8	11	15	21
City of Leesburg	—	—	0.5	1.3	2.3
Total	347.6	512.0	709.5	981.3	1364.3
Other Sources					
Patuxent River	65	65	65	65	65
Wells in Prince George's County	15	15	15	15	15
Occoquan Creek	51	72	98	132	150
Goose Creek	4.5	6	9	12	16
Wells & Springs at Leesburg	0.8	1.4	1.5	1.5	1.5
Misc. Wells & Streams	4.0	4.0	4.0	4.0	4.0
Total	140.3	163.4	192.5	229.5	251.5
TOTAL	487.9	675.4	902.0	1210.8	1615.8

The maximum amount of water that must be supplied by the Potomac River and by its Estuary under low-flow conditions can be diverted by gravity flow and pumping from the river above Great Falls, by pumping at Little Falls, and by pumping from the Estuary below Little Falls. These amounts are shown below for the maximum day in each of the years studied.

	Diversion in Millions of Gallons Per Day			
Year	Above Great Falls	At Little Falls	From Estuary	Total
1970	290	53		343
1980	290		222	512
1990	290		420	710
2000	290		691	981
2010	290		1,074	1,364

The amounts of water shown above are based upon the assumption that the maximum day occurs on the day of the lowest discharge of record for the river near Washington, D.C., which was 390 mgd on September 10, 1966. The occurrence of these two events on the same day represents the most adverse conditions that might affect water supply for the Region and this does not appear probable, as the two usually occur at different times at the low-flow season. Also, the probability of a discharge as low as 390 mgd occurring near Washington, D.C., is not high. Based upon past experience this may on the average be expected to occur in the future about once in 15 years.

The amount of water available above Great Falls for municipal water supply has been reduced by 100 mgd in the years 1970 through 2010 to make this available for flow down the river from Great Falls to Little Falls. This was the minimum flow over Little Falls during the drought in 1966, and has been used here as an amount that might be acceptable. At Little Falls about 20 mgd of this water will be diverted to the C & O Canal and the rest will flow over Little Falls into the Estuary.

The flow from Great Falls to Little Falls and over Little Falls to the Estuary is considered to be necessary for esthetic reasons and to maintain the flow required for the benefit of aquatic life. The flow through the C & O Canal, all of which discharges into the Estuary, is necessary for esthetic reasons, for recreational purposes and to supply water to the hydroelectric generating plant and a direct-drive water wheel of the Wilkins-Rogers Milling Company, Inc., located in Georgetown in the District of Columbia. The water supply to the Wilkins-Rogers Milling Company, Inc., can probably be interrupted in future emergencies as it has in the past, in which case only about 2 mgd would be required for the C & O Canal.

The amount of water to be diverted at Little Falls, shown in the above table, is only that which is available from the discharge of the river in excess of the diversions to be made above Great Falls, and the 100 mgd diverted to the C & O Canal and flowing over Little Falls. It does not include water pumped from the Estuary to Little Falls for municipal water supply that must also be pumped by the Little Falls plant to the Dalecarlia Filter Plant.

Some of the water shown in the above table must be pumped from the Estuary, starting before 1980, for the Washington Aqueduct, for the Washington Suburban Sanitary Commission before the year 2000, and for the City of Alexandria before 2010. The amount required for each of these, for the maximum day in the years studied, is as follows:

	Millions of Gallons Per Day			
Year	Washington Aqueduct	Washington Suburban Sanitary Commission	City of Alexandria	Total
1970	—	—	—	—
1980	222	—	—	222
1990	420	—	—	420
2000	608	83	—	691
2010	807	231	36	1,074

7. Pumping Plants Required To Take Water from the Potomac River Estuary for Municipal Water Supply

A study has been made of the type, size, location and cost of the pumping plant that will be needed by the Washington Aqueduct to take water from the Estuary in the future. The pumping plants needed by the Washington Suburban Sanitary Commission and the City of Alexandria for taking water from the Estuary have not been studied, as these would be a part of the normal water system development of these agencies even if large dams and reservoirs are constructed on the Potomac River. The pumping plant for the Washington Aqueduct would, however, be constructed in lieu of the large dams and reservoirs.

The pumping plant located on the Estuary that would be needed to supply the emergency requirements of the Washington Aqueduct (hereinafter called the Palisades Pumping Plant) should, if practicable, be ready for initial operation by about the year 1970, although it probably would not have to pump any appreciable amount of water in that year under the most adverse conditions which might occur. It should be able to pump increasing amounts thereafter up to 807 mgd by the year 2010. The need for reserve pumping capacity in this pumping plant is questionable, and none is proposed herein. The probability of an extremely low discharge of the Potomac River, to place a maximum demand on the pumping plant, is not high, and when this condition does occur it will last only a relatively short time. In addition, the reliability of pumping units of the type subsequently suggested for this plant is inherently high, and the large amount of time when they will not operate will be more than sufficient for performing adequate preventive maintenance.

The capacity in the Palisades Pumping Plant should probably be installed in four units, which could be constructed in two phases of two units each to meet the requirements as they increase. Installation of these units should be as follows:

Phase 1—1970 Units 1 and 2 of 200 mgd each
Phase 2—1990 Units 3 and 4 of 200 mgd each

The Palisades Pumping Plant should probably be located on land now owned by the Federal Government between the C & O Canal and the Potomac River about 13,000 feet downstream from the Little Falls Pumping Plant in the vicinity of Fletchers Boat House, as shown in the plate on the outside back cover. This is a section of the river commonly called the Potomac Palisades. There appears to be sufficient space for the pumping plant at this location, and the Potomac River Channel starts to widen and deepen here, making it suitable for a forebay. The elevation of the water in the forebay at Little Falls Pumping Plant to where water from the Estuary would be pumped is only about 40 feet above the mean low water elevation of the surface of the river at the proposed Palisades Pumping Plant. This is a relatively low head against which to pump water, and the cost for electric energy should be comparatively small.

One pressure pipe with a 9-foot inside diameter, running 13,000 feet from the Palisades Pumping Plant to the forebay at Little Falls Pumping Plant, would be installed for each pair of pumping units. The two pipes would be buried in trenches located between the low-water bank of the Potomac River and the C & O Canal, on land now owned by the Federal Government in an area that is only under water during a high discharge of the river.

This is a convenient location for the construction of the Palisades Pumping Plant and associated pipelines, as the area is readily accessible for the transportation of construction materials. No access road or railroad would have to be constructed. A road now runs along the river side of the C & O Canal the entire distance from the Palisades Pumping Plant Site to the Little Falls Pumping Plant, and a branch line of the Baltimore and Ohio Railroad located between the road and the river, runs by the pumping plant site and upstream for a half-mile before crossing the canal.

The pumping units would be of the electrically-driven turbine or propeller type, each requiring about 2000 kva of power at full load. The plant would be fully automatic and remotely controlled from either the Little Falls Pumping Plant or the Dalecarlia Filter Plant.

The construction cost of the Palisades Pumping Plant is estimated to be as follows:

	Cost in Thousands of Dollars		
	Phase 1	Phase 2	Total
Pumping units, accessory electrical and mechanical equipment, and substation	$1,210	$1,210	$2,420
Intake and building	1,400	700	2,100
Pipeline	2,090	2,090	4,180
Total	$4,700	$4,000	$8,700

These construction costs are based upon prices as of December, 1967. They do not include an allowance for the effects of future inflation or the escalation of wage rates.

The $8.7 million cost of constructing the Palisades Pumping Plant will be but a fraction of the cost of $393 million (1962 prices) that would be required to construct the 16 large dams and reservoirs that have been proposed to augment the low flow of the Potomac River. The construction cost of the Palisades Pumping Plant will also be considerably less than the $58 million portion of the cost of the 16 large dams and reservoirs that has been allocated to water supply, most of which is for the benefit of the Region.

The $8.7 million cost of constructing the Palisades Pumping Plant will also be much less than the cost of $77.3 million (1967 prices) that would be required to construct the Bloomington dam and reservoir, primarily for the benefit of the Region's water supply. This is the first of the 16 projects proposed for construction. The $8.7 million construction cost for the Palisades Pumping Plant appears more favorable still when compared with the cost of the Bloomington dam and reservoir together with an additional $32.8 million (1962 costs) construction cost for the Little Cacapon, Sideling Hill Creek and Town Creek dam and reservoir projects, proposed by the Department of the Interior in its Interim Report on the Potomac River Basin.

The Palisades Pumping Plant could be constructed in the relatively short time of about 18 months; possibly less, if required by an emergency. The equipment that would be used is of a conventional type that should be readily available; but smaller pumping units could be used in an emergency if they could be supplied in a shorter time. The project is relatively small, so that the work should not pose the difficulties frequently encountered in the construction of large dams and reservoirs which usually require between 3 to 5 years to construct.

The Washington Suburban Sanitary Commission will need by the year 2010 a pumping capacity of 428 mgd in addition to the 70 mgd now installed at its Potomac River Pumping Plant, in order to supply the requirements of the maximum day. A maximum of 267 mgd is all that could be supplied from the Potomac River Plant if there were no low-flow augmentation in order to leave 100 mgd in the river channel. The remaining 231 mgd would have to be supplied from the Estuary. However, if there were low-flow augmentation the entire 498 mgd could be taken at the Potomac River Pumping Plant. In either case pumping capacity will have to be installed to supply the 231 mgd. Installing pumping capacity on the Estuary instead of at the Potomac River Pumping Plant will probably eliminate the future need for a dam across the river to provide a forebay for the Potomac River Pumping Plant. Such a dam and forebay would have an adverse ecological effect upon this area.

The installation of pumping capacity on the Estuary by the Washington Suburban Sanitary Commission appears to have merit in view of the rapidly increasing demand for water in the nearby Prince George's County area, which it could supply. The pumping plant could be located near the Estuary in Prince George's County so as to deliver water directly to the water mains in the county after treatment, instead of transporting water to the area by pipeline some 40 to 45 miles from the Potomac River Pumping Plant, as is now done. It might be desirable to operate this pumping plant to a certain extent all of the time once it is constructed. This would pose no particular problem, as the Potomac River would discharge more water into the Estuary than would be taken out by all the pumping plants even in a dry year in all but the summer months, and during an occasional short period in the autumn, as subsequently discussed.

A pumping plant on the Estuary for the Washington Suburban Sanitary Commission could be put underground if desired, to avoid an adverse effect upon the appearance of the riverbank; it could be controlled remotely so that no operators would be required. The treatment plant for the water could be located away from the river at a suitable place, where it would not be objectionable with appropriate architecture and landscaping.

The Alexandria water system, operated by the Fairfax Water Authority, will by 2010 need—in addition to the water available from Occoquan Creek—pumping capacity that could take about 36 mgd from the Estuary in order to supply the requirements of the maximum day, unless arrangements are made to obtain water indirectly from the Estuary. Fairfax County has considerable frontage on the Estuary, so it should be possible to find a suitable location for a pumping plant.

8. *The Cost of Pumping Water from the Potomac River Estuary for the Washington Aqueduct*

The major cost in connection with the Palisades Pumping Plant of the Washington Aqueduct will be the fixed costs. The cost of maintenance and electric power will be relatively low, as the plant will not be operated much of the time even when the amount of water supplied to consumers has increased substantially. These costs are shown in Table 2 separately for pumping for the Washington Aqueduct, and pumping to permit maintaining a minimum flow of 100 mgd in the river for water years which correspond approximately with each of the years studied, under low-flow conditions on the Potomac River.

The annual cost of the Palisades Pumping Plant even when pumping water to maintain a minimum flow in the river as shown in Table 2, is but a fraction of the average annual cost of $20.8 million (1962 costs) for the 16 large dams and reservoirs that have been proposed.

The cost of pumping water from the Estuary by the Palisades Pumping Plant has been determined for water

Table 2
ANNUAL COST FOR PALISADES PUMPING PLANT
1970-2010 Inclusive
Thousands of Dollars

	Water Year				
	1970	1980	1990	2000	2010
Maintenance					
Basic Requirements	$ 32	$ 32	$ 62	$ 62	$ 62
Minimum Flow Maintenance	8	8	8	8	8
Total	40	40	70	70	70
Electric Power					
Basic Requirements	2	2	16	38	102
Minimum Flow Maintenance			11	14	35
Total	2	2	27	52	137
Fixed Costs					
Basic Requirements	270	270	270	270	270
Minimum Flow Maintenance	67	67	67	67	67
Total	337	337	337	337	337
Total Cost					
Basic Requirements	304	304	348	370	434
Minimum Flow Maintenance	75	75	86	89	110
TOTAL	$379	$379	$434	$459	$544

years running from October 1, which is normally about the time higher water begins to be available each year, through September 30 at the end of the following dry season. A water year is considered to be desirable rather than a calendar year which would include the months of October, November, and December, at the beginning of the wet season for the succeeding year.

Operating costs for this plant will be small and consist chiefly of maintenance expense as it will be an automatic plant remotely controlled by the present operators from the Dalecarlia Filter Plant or the Little Falls Pumping Plant.

Electric power will be purchased from the Potomac Electric Power Company under the LP rate schedule, applicable to large loads.

The fixed costs consist of a uniform annual amount for the depreciation of plant, interest at 3¼ percent a year on the depreciated investment, and replacements over the 45-year service life of the pumping plant, and administrative general expenses.

The amount of energy used by the Palisades Pumping Plant in pumping municipal water from the Estuary and to replace the water flowing over Little Falls in the water years studied, under low-flow conditions resulting in the maximum use of energy, the number of days the pumps would be operated and the amount of water to be pumped, are shown in Table 3.

Table 3

ELECTRIC ENERGY REQUIRED, DAYS OPERATED AND QUANTITY OF WATER TO BE PUMPED BY THE PALISADES PUMPING PLANT

	MWH Energy Required	No. Days Operated	bg Pumped
1970			
Basic Requirements	Nil	Nil	Nil
Minimum Flow Maintenance	Nil	Nil	Nil
Total	Nil	Nil	Nil
1980			
Basic Requirements	Nil	Nil	Nil
Minimum Flow Maintenance	Nil	Nil	Nil
Total	Nil	Nil	Nil
1990			
Basic Requirements	1,040	41	4.9
Minimum Flow Maintenance	1,088	52	5.2
Total	2,128	52	10.1
2000			
Basic Requirements	3,042	62	14.5
Minimum Flow Maintenance	1,553	74	7.4
Total	4,595	74	21.9
2010			
Basic Requirements	9,668	122	46.0
Minimum Flow Maintenance	3,423	163	16.3
Total	13,091	163	62.3

The daily virgin discharge of the Potomac River near Washington, D.C., for the 1965-66 water year, which includes the lowest flow of record, is shown in Figure 3 on page 12, compared with the actual total diversion for municipal water and the C & O Canal in that period, and with the estimated diversions for municipal water only in the water year 2010. The water year 2010 has been used in Figure 3 because the diversion in this year is the maximum in the period studied, and it appears that the method of supplying this diversion can be used to the extent needed to supply the smaller diversions in prior years.

The diversions in the water year 2010 have been distributed in the same monthly proportion as the diversions actually made in the years 1965-66. The average daily diversion in each month for the year 2010 has been used in Figure 4, without showing the diversion for each day. This procedure is considered adequate to indicate the approximate total volume of water that must be pumped. The volume of water required for municipal use that must be pumped from the Estuary is indicated by the shaded areas on Figure 4. The water that must be pumped from the Estuary has been apportioned among the agencies which will do the pumping in proportion to their forecast maximum daily demand for water.

The Palisades Pumping Plant will be needed chiefly in years of low water and will not be used in median and high water years with the exception of a few days in some of these years. As a result the cost of electric power in these years will be chiefly the monthly minimum charge of $154, and the cost of maintenance will be somewhat less than the amounts previously shown.

The limited extent to which the Palisades Pumping Plant will be required to operate may be judged from a determination of the amount it would be operated if the future discharge of the Potomac River near Washington, D.C., is similar to the actual discharge during the last 37 years. On this basis the probability of the Palisades Pumping Plant being operated to assist in supplying the forecast municipal water requirements of the Region, while maintaining a minimum flow of 100 mgd from Great Falls to the Estuary in each of the years studied, is as follows:

Water Year	% Probability of operating
1970	0.0
1980	0.1
1990	1.2
2000	3.4
2010	9.4

In considering the desirability of constructing the Palisades Pumping Plant it is significant to note that it will not operate to an appreciable extent until after the end of this century. The Pumping Plant will probably not be operated at all in 27 of the 40 years from 1970 to 2010, but it will provide low-cost insurance against a possible shortage of municipal water in the Region in an occasional year for a short period of time. The potential need for supplemental water is so small for the foreseeable future that it is difficult to justify the expenditure of the large amount of public funds for the 16 dams and reservoirs that have been proposed heretofor when the Palisades Pumping Plant can supply all the water needed at a fraction of the cost.

To maintain a flow of 100 mgd in the Potomac River from Great Falls to the Estuary under low-flow conditions, the Washington Suburban Sanitary Commission and the Washington Aqueduct must permit this volume of water to bypass the intakes to their pumping plants. This probably would not increase the cost of pumping by the Washington Suburban Sanitary Commission, since the pumping would be done in an estuarial pumping plant instead of the Potomac River Plant. The Washington Aqueduct would, however, have to pump an additional 100 mgd from the Estuary to the intake of the Little Falls Pumping

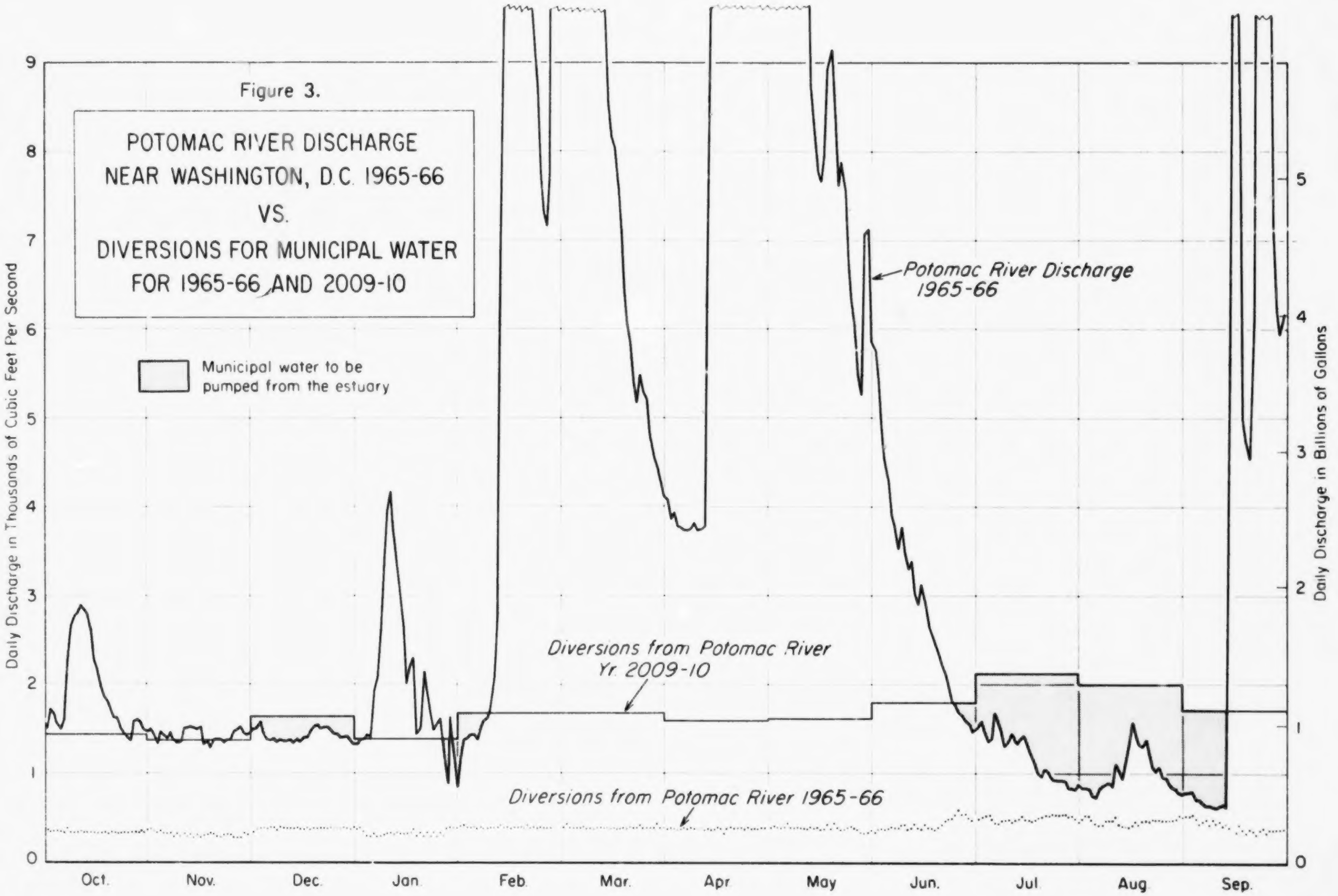

Figure 3.

POTOMAC RIVER DISCHARGE
NEAR WASHINGTON, D.C. 1965-66
VS.
DIVERSIONS FOR MUNICIPAL WATER
FOR 1965-66 AND 2009-10

Plant at costs shown in Table 2. The number of days of pumping, as shown in Table 3, would also increase somewhat.

The pumping cost which would stem from maintenance of a flow of 100 mgd in the Potomac River from Great Falls to the Estuary should, it appears, be allocated to all of the water systems that are supplied water by the Washington Aqueduct, in proportion to the quantity of water taken. This is appropriate, since the need for pumping 100 mgd from the Estuary is the result of their usage of Potomac River water.

The possibility of producing hydroelectric energy from these units at times when they are not needed for pumping has been investigated and found to be uneconomic.

9. The Potomac River Estuary

The Potomac River Estuary extends for 117 miles to its junction with the Chesapeake Bay. Water is added to it by many tributaries, the largest of which is the Anacostia River, which enters at Washington. The total contribution of the tributaries in the reach of most interest in this study, which is that part of the Estuary between Little Falls and the vicinity of Indian Head, Maryland, is not sufficient however to add appreciably to the water in storage in the Estuary, as their drainage area is only 4 percent of the total drainage area of the Potomac River above Indian Head.

The width of the Estuary varies from a few hundred feet at the head to almost 6 miles at the mouth. Shallow depths are found throughout most of the estuarine reach except in the channel. The reach from Little Falls downstream 2½ miles to Three Sisters, in which section it is proposed to locate the Palisades Pumping Plant, is by contrast fairly deep in most places.

The Estuary is a drowned valley where the fresh waters of the Potomac River and the salty waters of the Chesapeake Bay mix. This mixing extends up the Estuary to the vicinity of Indian Head, where a brackish-water front exists. Although some salty water intrudes beyond this front, the chloride content is within the limits considered desirable for municipal water.

The ocean tides which reach to Little Falls, where the river makes its last descent over the fall-line rocks into the Estuary, are a major contributor to the mixing of the waters. The mean tidal range in the Washington Channel is 2.9 feet.

The upper reach of the Estuary, which contains fresh water, is a relatively narrow section extending for a distance of about 24 miles to the brackish-water front. The width of the Estuary in this reach does not exceed about 1¾ miles, as may be seen in the back-cover illustration.

The total volume of water discharged by the Potomac River in every water year exceeds by many times the 100 bg of fresh water that is held in natural storage by the upper Estuary. As a result, this reach of the tidal river is thoroughly flushed several times every year. For example, the total discharge of the Potomac River into the Estuary in the low-water year of 1965-66 was about 1,300 bg, excluding the water taken for municipal use; or 13 times the 100 bg of fresh water in natural storage. In the high-water year of 1948-49, the total discharge of the Potomac River into the Estuary was 3,800 bg, or 38 times the volume of fresh water in natural storage.

Not all of the discharge of the Potomac River is effective in flushing the upper reach of the Estuary, as the rate of discharge must be over about 10,000 cubic feet per second for perhaps as long as a minimum of 10 days in order to reach the brackish-water front. Such conditions occur several times in every year, however, even in years of extremely low water.

In addition to the water discharged into the Estuary by the Potomac River and its tributaries, waste water will also be discharged into the Estuary. The annual amount of this forecast for the years studied, is as follows:

Water Year	Billions of Gallons
1970	93
1980	131
1990	187
2000	260
2010	352

The amounts of waste water shown above will be derived from used municipal water supplied from the Potomac River, water imported into the Potomac River Basin from the Patuxent River Basin, water taken from small streams, wells and springs, and, starting with 1980, water pumped from the Potomac River Estuary. The volume of sanitary waste water is fairly uniform throughout the year. This will make it easier to dispose of the sanitary waste water if it is decided to transport it any distance from the places where it is treated.

The increasingly large volume of waste water will, if properly treated and discharged at the right places in the Estuary, have little or no adverse effect upon the environment. If these things are properly done, the continued availability of an adequate amount of fresh water in natural storage to supply the emergency requirements of the Region can be assured.

By installing the Palisades Pumping Plant it will be possible to meet all of the emergency municipal water requirements of the Region until about the end of this century, without taking more than a small amount of water from the Estuary. Thus there will be adequate time to make the needed changes in the treatment of waste water and its discharge to the Estuary, so as to bring about an improvement in the estuarial water which, it is expected, will be required by the Federal Water Pollution Control Act.

10. Quality of the Water in the Potomac River Estuary

In considering the adverse effects of pollutants in the Potomac River Estuary, it might be helpful to understand how impurities get into the water and how they can be removed. Water is used over and over again in the natural hydrologic cycle of the world. In this cycle atmospheric moisture that is in transportation and storage, almost free of pollutants, eventually falls to the earth as precipitation. There it is disposed of by surface runoff and evaporation, by infiltration into the ground, and by transpiration from trees and other vegetation. All this water remains in the hydrologic cycle. Part of it is initially returned to the atmosphere by evaporation and transpiration, and the remaining portion goes into storage in the ground or in lakes, ponds, and the oceans. From these natural reservoirs it is evaporated to repeat the cycle.

The waters in the natural hydrologic cycle become polluted to a certain extent as they move over the surface of the earth and through the soil and rocks, until again taken into the atmosphere by evaporation or transpiration, or after reaching the oceans from where they are evaporated. In either case they leave the pollutants behind. The pollution of the portion of these waters that is used by man for municipal and industrial purposes is increased, because of use primarily for transporting unwanted waste substances. These substances are usually fecal material, soap and detergents, chemicals, heat and other materials. The water itself is not changed by addition of these pollutants. Upon their removal by the natural process of flowing streams, and while in storage or in man-made treatment plants, the water becomes suitable for reuse. The effectiveness of these natural and man-made purification processes is indicated by the large extent to which water, during its stay on earth, is being reused today for municipal and industrial purposes in many parts of the United States.

Pollutants entering the Potomac River Estuary from the Region are chiefly from the following sources:

1. Municipal Waste Water
2. Storm Waters
3. Boats and Ships
4. Dredging Materials

All of these pollutants can be reduced to a satisfactory level using means now available.

A comprehensive estuarine pollution study by the Department of the Interior to develop recommendations for a national action program, was directed by the Congress in the Clean Water Restoration Act of 1966. Under the Act the Secretary of the Interior must report on the matter by November 1, 1969; but he has indicated that recommendations for action may be made earlier. The study is needed; for, while we may in the past have planned well in our separate compartments for a single purpose there is now a need for consideration of all phases of the Estuary problem in the full perspective of their inter-relationship. It seems that, so far, no group of planners has considered the ecological impact of their proposals on the Estuary, even when confronted with a certain threat to its natural values. What is needed is better Estuary management.

Processes commonly used for many years can be employed to remove pollutants from municipal waste water of the Region. Filtration (usually through beds of sand), sedimentation (by precipitation and settling) and coagulation (by thickening or curdling) can be employed to remove up to 95 percent of the suspended solids. Oxidation by forced aeration can make oxygen-demanding substances inert by removing up to 95 percent of the biochemical oxygen demand (BOD). These are usually referred to as primary treatment (filtration and sedimentation) and secondary treatment (oxidation) and use what is called the activated sludge process.

Nutrients (nitrogen and phosphate) remaining in the effluent from the treatment plants, which result in the biological enrichment or eutrophication of the Estuary, stimulate the growth of aquatic plant life such as algae. These die and sink to the bottom, and as they decompose will absorb oxygen from the water. This shortage of oxygen may kill animal life, which in turn decomposes. This however does not make the water unusable for municipal purposes when properly treated. These nutrients can however be removed by additional treatment such as adsorption, or perhaps by a modification in the conventional primary and secondary treatment to increase the aeration. An increase in aeration can, at least in some treatment plants, remove most of the phosphates which will drastically reduce the growth of aquatic plant life. A joint Government and soap and detergent industry task force has recently been established by the Secretary of the Interior to investigate eutrophication, including the role that phosphates and detergents play in the process, and their possible replacements.

The effluent from waste water treatment plants is normally treated with chlorine to sterilize it. When this is done adequately, the coliform bacteria count can be kept low. Effluent from the Blue Plains sewage treatment plant of the District of Columbia, which treats most of the waste water in the Region, is not well treated. As a result, the effluent pollutes the Estuary more than it should. Instead of the Blue Plains plant removing up to 95 percent of the contaminants, as is possible with a well-designed and operated treatment plant, the removal has been as low as between 60 percent and 70 percent in the summer. In addition the plant does not remove an adequate amount of nutrients, with the result that algae flourishes in the Estuary. These are matters which must be corrected under the Federal Water Pollution Control Act. Plans have recently been initiated toward this end.

Storm waters from the Region should be treated before release to the Estuary to prevent pollution from this source instead of overflowing without treatment when the capacity of sewers is reached as is presently the case. These waters contain pollutants deposited on streets and highways and from other sources, such as garbage, animal and vehicle droppings, newspapers, dirt and pesticides, and all manner of debris. When storm waters overflow, they also contain sewage picked up in the sanitary sewers. In order to treat the polluted storm waters it will probably be necessary to enlarge the sewers leading to the treatment plants, and increase the capacity of the plants. As an alternative, provision might be made for temporary storage of storm waters so they can be subsequently transported to treatment plants through existing sewers a little at a time, to avoid need for increasing capacity of the sewers and the treatment plants.

The District of Columbia has, for a number of years, gradually been separating storm sewers from sanitary sewers so that storm waters will discharge directly into the Estuary without treatment. This does not solve the basic problem of keeping pollutants out of the Estuary, and in addition is costly. Also unfortunately, there is usually considerable precipitation in the Region during the low-flow season, and storm water flushes pollutants into the Estuary when the river is not high enough to flush them out.

Storm waters can be stored temporarily in a number of ways, depending upon circumstances. Among these are storage in ponds and sewers, and storage in tunnels and caverns beneath city streets. The City of Chicago is presently boring a tunnel beneath streets, near the northern city limits, for use as a waste-water storehouse. Waste water after a storm can be gradually pumped from storage into the existing sewer system leading to treatment plants. It has been estimated that this method of handling storm waters is less costly than separating storm and sanitary sewers, and in addition provides for treatment of the storm waters, not usually contemplated in the separation of the sewers. Several other major cities in the United States either have started construction of projects to eliminate pollution from storm water or are studying the matter.

Pollution released from boats and ships in the Estuary can be controlled by promulgating proper regulations. Major sources of pollution are sewage, oil, garbage and ballast and bilge water. Steps have recently been initiated to control these by Federal legislation.

Pollution of the Estuary by dredging materials is being studied and it is expected this will be adequately controlled in the foreseeable future.

Although the average citizen of the Region is likely to call the Potomac River a cesspool or an open sewer this is to say the least incorrect. The quality of the water entering the Region is reasonably good and is improving. The quality of the water in the upper Estuary is determined by the Region and not by upstream abuses, as pollution in the Estuary remains near its originating source. Primary cause of the difficulties in the Estuary is growing population and lack of adequate treatment for waste and storm waters that are discharged directly into the Estuary. If the steps previously outlined in this study are taken, quality of the water in the Estuary should improve considerably.

The cost of keeping pollution out of the Estuary will be relatively small in comparsion with the increasingly adverse effects that may be otherwise expected if this is not done. Among other things, it will be less costly to take municipal water for emergency use from a clean Estuary than to construct 16 large dams and reservoirs upstream to dilute pollution and supply the water.

The upper Estuary of the Potomac River would in each month of a low-water year receive more water from the discharge of the river than would be taken from the Estuary for municipal water in each of the years studied, until July in the year 2000. Starting in that month under these emergency conditions, more water would be taken from the Estuary than would be supplied by the Potomac River discharge in the months of July and August, as may be seen in Table 4. This condition could first occur in a low-water year between the years 1990 and 2000, and might occur in any year thereafter under these emergency conditions. Such emergency conditions may be expected only occasionally, as previously noted.

By the year 2010 the amount of water taken from the Estuary would in a low-water year slightly exceed the discharge of the Potomac River in the month of November as may be seen in Figure 3. The net amount of water taken from the Estuary would however be relatively small and not of significant importance.

It will be observed that the net amount of water taken from the Estuary for municipal water is relatively small in all cases compared with the 100 bg of fresh water held in natural storage.

Table 4

COMPARISON OF THE AMOUNT OF WATER REQUIRED FROM THE POTOMAC RIVER DURING SUMMER MONTHS WITH THE 1965-66 DISCHARGE

		mg		
		Required From P.R.	P.R. Discharge 1965-66	Excess Discharge
1970	Jun	7,900	58,300	50,400
	Jul	9,600	24,000	14,400
	Aug	9,100	20,300	11,200
	Sep	7,550	119,200	111,650
1980	Jun	11,700	58,300	46,600
	Jul	14,200	24,000	9,800
	Aug	13,500	20,300	6,800
	Sep	11,200	119,200	108,000
1990	Jun	17,400	58,300	40,900
	Jul	21,200	24,000	2,800
	Aug	20,100	20,300	200
	Sep	16,700	119,200	102,500
2000	Jun	24,900	58,300	33,400
	Jul	30,400	24,000	(6,400)
	Aug	28,700	20,300	(8,400)
	Sep	23,800	119,200	95,400
2010	Jun	35,000	58,300	23,300
	Jul	42,700	24,000	(18,700)
	Aug	40,300	20,300	(20,000)
	Sep	33,400	119,200	85,800

All the water that enters the municipal water systems of the Region will be discharged into the Estuary as effluent from waste water treatment plants, except for losses by leakage from the water and sewer systems, use losses such as evaporation, transpiration from watered plants and trees, or passage into the ground after use. These losses will be about 25 percent of the total entering the water systems.

In the year 2010 for example the following quantities of waste water from municipal systems are expected to be returned to the Estuary during the summer months.

Month	Billions of Gallons
June	47.9
July	58.3
August	55.0
September	46.7

These amounts are substantially greater than the net amounts it is proposed to take from the Estuary for municipal water supply shown in Table 1. As a result, the use of water from the Estuary for municipal water supply will not decrease the total volume of fresh water in natural storage, and the brackish-water front will not move upstream because of this use.

It may be desirable at some time in the future to transport part or all the municipal waste water of the Region to a point near the brackish-water front before discharging it into the Estuary. This would, to a considerable extent, prevent mixing the waste water with the fresh water in natural storage. The need for such transportation will not develop, however, until about the end of this century, as there is about 13 bg of fresh water of good quality in natural storage in the upper Estuary between Little Falls and the Blue Plains Waste Treatment Plant.

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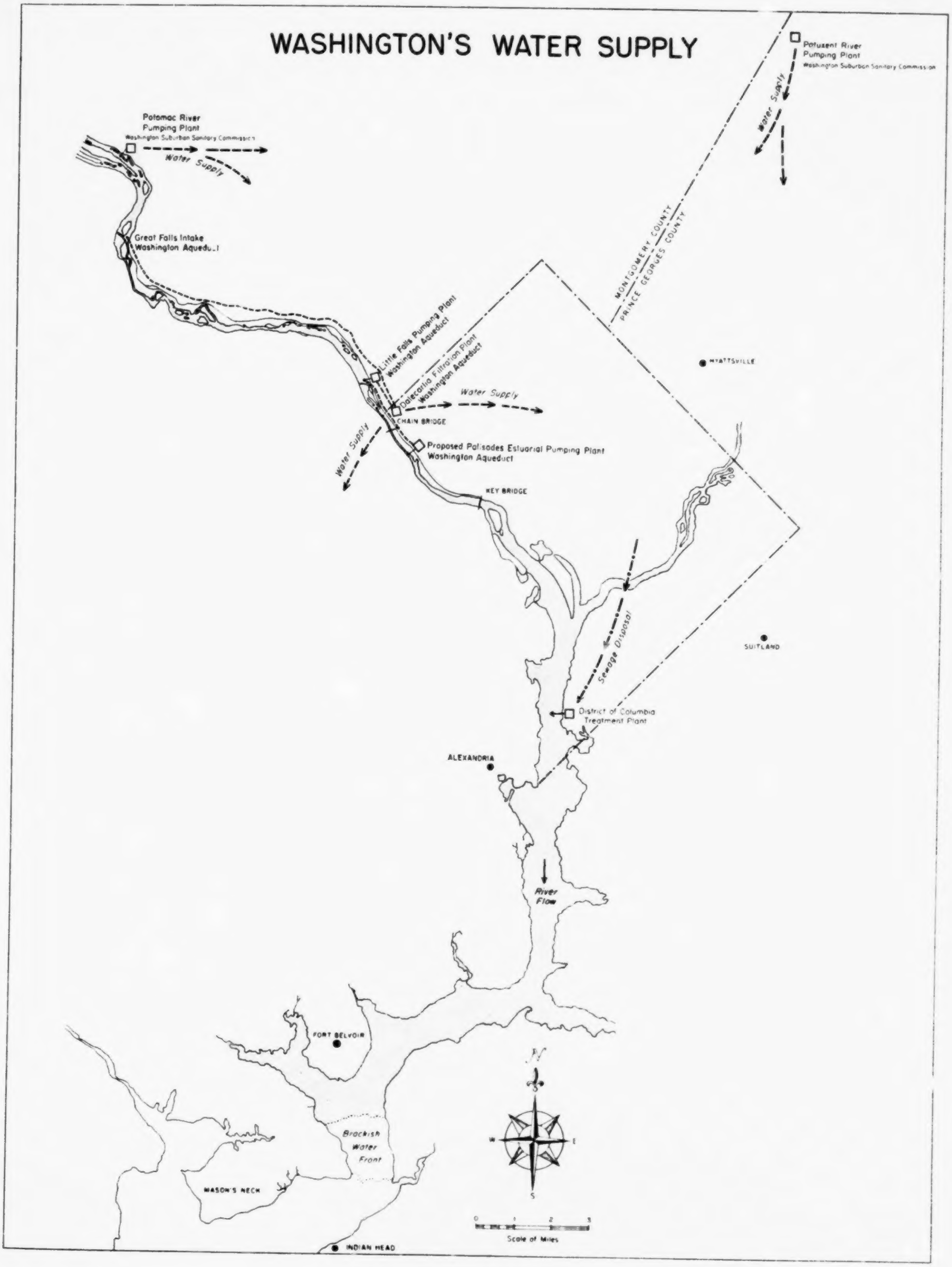
WASHINGTON'S WATER SUPPLY


Potomac River
Pumping Plant
Washington Suburban Sanitary Commission
Water Supply
Great Falls Intake
Washington Aqueduct
Little Falls Pumping Plant
Washington Aqueduct
Dalecarlia Filtration Plant
Washington Aqueduct
Water Supply
CHAIN BRIDGE
Water Supply
Proposed Palisades Estuarial Pumping Plant
Washington Aqueduct
KEY BRIDGE
Patuxent River
Pumping Plant
Washington Suburban Sanitary Commission
Water Supply
MONTGOMERY COUNTY
PRINCE GEORGES COUNTY
HYATTSVILLE
SUITLAND
Sewage Disposal
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Treatment Plant
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Flow
FORT BELVOIR
Brackish
Water
Front
MASON'S NECK
INDIAN HEAD
N
W
E
S
0
1
2
3
Scale of Miles

SECRETARY KLEIN: Thank you.

Are there any comments?

Mr. Hope, I thought you might have a comment as to the question of availability of future water supply. Is it correct that we are going to be short at a later date?

MR. HOPE: It has been stated at the conference previously, there have been periods of time where the flow in the river has approximately lacked the demand for the domestic water supply in the metropolitan area, and I think this matter of considering the full use of the Potomac River as it relates to the matter of providing adequate domestic water supply, which is a top priority consideration is one that has to be considered in connection with the total development of the river.

SECRETARY KLEIN: Thank you, and I will agree with you that domestic supply comes first.

MR. HOPE: Right.

SECRETARY KLEIN: We have had that same problem elsewhere. We send it down the Illinois River and Peoria gets one-fourth of their drinking water from the Illinois waterway. That is why we are doing tertiary and everything else to try and upgrade it.

Any questions on my right?

MR. JACKSON: Mr. Chairman, may I comment?

SECRETARY KLEIN: Yes, Mr. Jackson.

MR. JACKSON: This proposal has been around for quite awhile, I believe. It was considered some time ago when the Corps first submitted its proposal.

I think it has been felt that that section of the estuary certainly serves as an emergency supply, but the question has to arise: Why would you want to use a treated effluent, which, of course, we have got to remember, and we still have a question of storm water runoff and combined sewers. All of this must enter into the picture if we are to consider this particular source as a water supply, when, for a cheaper amount of money, you can provide impoundments in the Potomac Basin and that this would serve not only the upper basin but also the lower basin as well.

I think this needs to be considered and I believe the Corps has done it, but there is the question of cost as well as the reliability and all of the factors that that entails, which I think should be considered more fully.

SECRETARY KLEIN: If I may, I would rather not get into that at this time, because then we are getting away from the purposes.

It is all right to present the paper and point out that there are difficulties with taking one proposal or another, but that is not the question at this time, and therefore, if I may, I would like to pass it up after your comments, Mr. Jackson.

MR. JACKSON: Thank you.

SECRETARY KLEIN: If there is nothing further, thank you, Mr. Morris.

Mr. Johnson?

MR. JOHNSON: Mr. Chairman, I believe that winds up everybody except me.

SECRETARY KLEIN: If I may say so, my superior, Secretary Hickel, says that the last is the most important, and now we have Mr. Carl Johnson.

MR. JOHNSON: I haven't met Secretary Hickel, but apparently he is a very intelligent fellow (laughter).

STATEMENT OF
MR. CARL J. JOHNSON
CONFEREE AND EXECUTIVE DIRECTOR
INTERSTATE COMMISSION
ON THE POTOMAC RIVER BASIN

MR. JOHNSON: My name is Carl Johnson. I am the Executive Director of the Interstate Commission on the Potomac River Basin. In October 1966 the Interstate Commission recommended to the Secretary of the Interior that the Conference on Pollution in the Washington-Metropolitan Area be reconvened. We are happy that our recommendation has borne fruit.

In making its recommendation the Commission noted that "during this nearly ten-year period (since the original conference) some treatment plants have nearly reached their capacity; others have not attained the levels of treatment anticipated; and new plants, in new locations, are being built or planned. Also with a rapidly expanding metro region, problems such as nutrient enrichment, land runoff, and trunk line sewers have become more and more critical."

WASTEWATER TREATMENT PLANTS

We believe that the record indicates in nearly every instance, treatment plants were built or improved upon as agreed in the 1958 conference. An exception is the Westgage Plant in Fairfax County. It would seem that in most instances where agreed upon treatment levels were not attained, the reason has been plant operation rather than plant capacity.

The record also indicates that agreed upon chlorination of effluents was not practiced in several instances. This again could be attributed to operations policy.

In view of the record,we would recommend improvement in conference follow-up procedures. Periodic visits by competent inspectors would seem to be in order.

Apparently in the original conference the significance of increased effluent discharges, due to rapidly expanding populations, was grossly underestimated. Possibly the assimilative capacity of the Estuary was overestimated, and cognizance was not taken of the effect of increasing withdrawals for water supply immediately above Washington.

We presume that reliable data is now available on the assimilative capacity of the discharge areas and on the need for fresh water inflow. If not, studies to obtain such data should be undertaken without delay.

We are concerned about what appears to be breaches of the no-effluent policy above the Washington water supply intakes and we also are concerned about the treatment and disposal of wastes which will be generated in such areas not accessible to the Potomac Interceptor. We believe it is not too early to study these potential problem areas.

Finally, as far as treatment plants are concerned, we would make three additional recommendations, in two instances to eliminate ambiguousness which occurred in the report of the first conference.

1. Each treatment plant should be assigned levels of attainment.

2. Disinfection of effluents should be required in specific terms rather than "as needed."

3. Conferences are to be expanded to encompass Prince William and Loudoun Counties, Virginia, and Charles and Frederick Counties, Maryland.

NUTRIENT REMOVAL

The Federal Water Pollution Control Administration Report of 1969 on Potomac River Water Quality, Washington-Metropolitan Area, states on page 7:

> "Special treatment to reduce phosphorus in sewage treatment plant effluents can control excessive algal growths."

We are well aware of the fact that several pilot plants are being operated in this metropolitan area.

In view of the above, we believe that the conferees should agree to require phosphorus removal. We realize the tremendous investments that will be required, however we believe this is a necessary step toward a totally useful river. While total investment costs will be high, and this has been pointed out this morning, when applied as a per capita per year cost, they are not nearly as impressive.

We believe strong educational programs should be instituted to bring about public understanding of these needs.

SEDIMENT CONTROL

The Interstate Commission on the Potomac has been a leader in the fight to control sediment from urban construction or non-agricultural sources. Nearly one-third of the sediment being deposited in the Potomac Estuary is generated in the Metropolitan region. Montgomery and Fairfax Counties have been leaders in urban sediment control. Similar programs must be adopted by the other counties in the Metropolitan area. In its report to the Interdepartmental Task Force onthe Potomac (1967) the Sedimentation and Erosion Sub-Task Force estimates that with appropriate measures silt reaching the streams of the basin from urban areas can be reduced by nearly 50 per cent.

We would recommend the following insofar as sediment control is concerned.

1. The Virginia Water Control Board seek authority to work on behalf of sediment controls.

2. The District of Columbia and the counties of the Washington-Metropolitan Area establish strong sediment control programs.

3. That the States of Maryland, Virginia, and the District of Columbia develop clearly defined policies providing for sediment controls during highway and road construction.

SEWERAGE SYSTEMS

We believe that the Project C Program of the District of Columbia relating to combined sewers has proceeded nearly according to the agreement reached in 1958 and that the District of Columbia should be commended for this.

We would recommend that the city of Alexandria undertake a program to relieve combined sewer overflows existing in that city. Agreement should be reached on time schedules.

We have been advised that a few combined sewers also exist in Arlington County. If this is true, then we would recommend separation programs in that county.

We are also concerned over repeated reports of trunk line sewer overflows in suburban areas. We would recommend that studies be undertaken to determine the reasons for these overflows and that suitable remedies be instituted. Some evidence exists that trunk line capacities are not always considered adequately, prior to rezoning.

POLLUTION FROM BOATS AND MARINAS

We would recommend that the three State level jurisdictions study this problem looking forward to the development of uniform regulations. The Interstate Commission will be ready to provide leadership if this is desired.

NEW TREATMENT PLANTS

We would point out that since 1958 a new waste treatment plant has been constructed near Piscataway Bay in Prince Georges County, Maryland, and a new plant is under construction on Pohick Creek in Fairfax County, Virginia.

We would recommend that:

1. These two plants be brought into the Conference record on the same basis as previously existing plants.

2. Some procedure be agreed upon whereby new plants constructed in the future will be brought into the Conference record.

LITTER AND TRASH

Litter and trash on the water is most unsightly and presents substantial safety hazards to boats in the estuary. Much of this material reaches the water from land and water-based operations within the Metropolitan area. At the same time, a large amount originates outside the area.

We recommend that:

1. Strong educational programs be developed to help alleviate this problem.

2. Studies be instituted looking forward to the development of devices to trap this material for disposal before it reaches the Estuary.

Thank you, Mr. Chairman.

SECRETARY KLEIN: Thank you, Mr. Johnson.

Are there any questions or comments by the conferees on my left? Mr. Hope.

MR. HOPE: One point, Mr. Johnson. On your page 4, where you make reference to the District of Columbia's need for a meaningful sediment control program, as you probably know, we have submitted and there is currently under consideration by the Council a regulation concerning this particular problem.

MR. JOHNSON: Yes. I am glad you brought that up.

I intended to make that as an ad lib, and it slipped my mind as I went along.

MR. HOPE: What little credit we can get during these three days, we would like to receive (laughter).

You do touch also on this matter of pollution from boats and marinas, and this was also part of a substantive proposal that we made to the District Council.

There was considerable opposition expressed to the development of regulations to be enforced by the District relative to the control of sewage discharges from water craft, and the basic argument which was used and which apparently carried considerable weight with the Hearing Officer was that this was a matter for Federal consideration and that there would be Federal legislation, currently under consideration by the Muskie Committee, which would pre-empt and take over at the Federal level the total control of the problem of sewage and other waste discharges from water craft.

Possibly our Chairman might be willing to comment on this point, but since you have raised it, I think it might be well to explore this a little bit because it is a problem that we are concerned with.

MR. JOHNSON: Mr. Hope, I think the information that we have received following the hearings that you referred to from various people did not indicate that these people were calling for Federal control.

Our information indicates that they were concerned and apprehensive about the fact that there are three state-level jurisdictions which all might have controls which were not uniform, and this would make it very difficult for the boatowner.

Also, I don't believe, although I may be completely wrong, that the Federal Act contemplates control over marinas.

MR. HOPE: I think it does insofar as it relates to the provisions of facilities necessary for the servicing of water craft, depending on what the final decision is as to what type of either treatment or holding is provided aboard the water craft.

I would say to you, having been at the hearing, that the matter of possible conflict between the three jurisdictions, the District, Maryland and Virginia, was not a critical one, because we had presentations by representatives from the State of Maryland indicating that they were thinking along regulations of the same general type that we were talking about, and we were permitted to make the statement that Virginia was also proceeding in that same direction.

My feeling is that those who were opposed to regulations and suggesting that the Federal control be used as an alternate approach, was that it was a temperizing sort of thing. We were prepared to act and the Federal Government has been discussing this particular problem for the last several years.

MR. JOHNSON: This has happened before.

SECRETARY KLEIN: If I may, it appears that control of sewage from vessels will now become law, as far as I know, from the Hill.

I am not going to try to outguess them. I will just put it on the basis of conferences that I have had, and I have been in this situation.

I will also state to you that once it becomes law, that the Federal Water Pollution Control Administration will be writing the standards as it is now set forth therein, and in writing those standards they will be directed by me to consult with all local jurisdictions in order that everybody will have a say therein, so that we come out with proper standards for marine sanitation devices.

In other words, we will try to work out something by putting everybody into it, and not just write something arbitrarily at the level of the Federal Water Pollution Control Administration.

MR. JACKSON: Mr. Chairman?

SECRETARY KLEIN: Yes.

MR. JACKSON: I would like to suggest that on the bottom of page 1, where Mr. Johnson suggests that the reason that a good many levels of treatment have not been obtained has been due to operation, that there are other reasons for that, and I will cite an example.

We have had a terrific problem with recirculators, which have been generated as a result of increased sludge load of our secondary treatment plant.

I don't believe any group of operators could have done any better than the group that we had at the plant trying to find the answer to the problem, and we even went outside for research, so that there are other reasons than just plain operation.

MR. JOHNSON: Norm, this is certainly true. My conception of plant operation includes such things as you mentioned, the inability because of design to obtain the desired plant operations.

MR. JACKSON: Carl, I want to thank you for the compliment. I, like Malcolm, like to have it, because it is done so infrequently.

Let me go on to page 3:

> "Each treatment plant should be assigned levels of attainment."

I submit here that this would be a recommendation that would affect not only the District of Columbia and all of the member jurisdictions of the Interstate Commission on the Potomac River Basin, and I would think that commission would want to consider such a recommendation as a group of commissioners.

I might suggest that, Carl, in discussing the matter for the record, as to whether this should be put in as a recommendation of the Interstate Commission on the Potomac River Basin.

MR.JOHNSON: Well, I know you understand it, Norm, and I hope that the people who are sitting out here today understand it, that I am not a Commissioner. I am the Executive Director of the Commission.

Now, as you know, we have not had a Commission meeting since this report was made.

These recommendations were made in my capacity as Executive Director. If the Commission sees fit to deny my recommendations, of course, this is their privilege.

That is the only answer I have.

MR. JACKSON: Carl, this was not a criticism. It was merely a matter for the record. You did receive the report late.

I just wanted the record to show that this is a recommendation submitted by you as Director, but it is not necessarily the action of the Commission in submitting it for the record of this conference.

One further point I would like to ask Carl about. What are your feelings on the recommendation that the subcommittee on sedimentation and erosion of the task force has recommended, I believe, an expenditure of about a quarter of a billion dollars for the removal of about 45 per cent of the possible sediment load? Do you have any feeling on this, or would you like to make any comment on it?

MR. JOHNSON: Yes, I do have a feeling on this, and I appreciate your giving me the opportunity to express it.

I feel, and my experience would indicate to me, that this is a program which the task force or sub-task force was planning to approach in a very expensive manner, and possibly is not the most effective way that we could do it, which would cost less money.

Now, I am referring principally to the metropolitan region, the urban area particularly, where we have no active programs normally above the county level.

The Soil Conservation Service of the Department of Agriculture has a far-flung technical service program for the rural areas. They are giving some limited assistance to metropolitan regions.

The agricultural policies have not changed to my knowledge in this aspect, and until that policy changes, in my judgment, the report or the recommendations of the task force will be less than effective.

I feel that the only way that we are going to control sediment in urban areas is to get county programs, one of which Mr. Finley described this morning. This is the only way that we are going to get effective sediment control programs in these metropolitan areas.

They are going to have to be on a county level, because the counties and the county officials are the people who control the things that are creating the sediment.

So, in direct answer to your question, I would not recommend all of this program that was produced by the sub-task force.

MR. JACKSON: Do I have the correct impression that a considerable portionof this would be on a reduction of erosion on secondary roads within the basin?

MR. JOHNSON: Yes, this is a basin-wide program. You understand that, but maybe the rest of the group don't. This is a basin-wide program that they were talking about, and one of the principal costs is the secondary roads.

Another principal cost is sediment detention structures, this type of activity, and this is really, in the case of sediment detention, what I call treating symptoms rather than getting at the disease. You are trapping something after it has happened, and in its place, these are valuable.

SECRETARY KLEIN: I will agree with Mr. Johnson.

We have one lake in Southern Illinois which, after 30 years, has practically no sediment in it because it was properly prepared for, and that is an impoundment and it can be done, but you have to do it in advance when you do the planning.

Are there any comments on my right?

MR. McKEWEN: One brief comment on the marina and water craft.

In addition to sharing waterway boundaries with the District of Columbia and Virginia, Maryland also has inland waterways, and therefore, it is concerned about uniformity throughout the entire east coast, and for that reason we would favor at least Federal guidelines to help promote such uniformity.

SECRETARY KLEIN: Thank you.

Mr. Johnson, I will just say to you that you saved me the trouble of summing up everything. It was a very good job.

Thank you very much.

MR. JOHNSON: Thank you.

SECRETARY KLEIN: The Conference will be recessed and the conferees will come back in Executive Session in the Continental Room at 1 p.m., if possible, please. It is right next door.

I understand that a good deal of the work of the Executive Session was done by Mr. Jensen at breakfast this morning with the conferees.

Following the Executive Session, we will meet again for a press conference at which all of you are invited. We will try to get around to it on general statements, because we can't make the specifics this fast. I hope it will be somewhere around 1:45 on the major items. We can't talk about minor items or specifics. We will just have to give generalities at that time.

(Whereupon, a recess was taken, after which the conferees went into Executive Session, and the following constitutes the statement of the conferees:)

The Conferees unanimously agreed that:

1. The Water Pollution Control Agencies in the District of Columbia and political subdivisions within Maryland, and Virginia, have made substantial investments in facilities for the abatement of pollution of

the interstate waters of the Potomac River and the Washington metropolitan area;

2. In spite of these investments, the Potomac continues to be polluted by discharges of sewage from combined sewers and inadequately treated sewage, nutrients, and sediments. It is to be noted, however, because of improved sewage treatment, the organic load has been reduced 41 per cent since 1947.

3. Discharges and sediments result in water quality degradation as evidenced by low dissolved oxygen, excessive algal growths, sedimentation, and high concentrations of fecal bacteria. These conditions restrict established water uses, create conditions hazardous to health and are incompatible with the water quality standards and criteria of the District of Columbia, the State of Maryland and the Commonwealth of Virginia, as adopted as Federal water quality standards and criteria, therein.

4. Effective waste treatment in the metropolitan area is complicated by the estuarine characteristics of the Potomac, by combined sewers within the District of Columbia and Alexandria; heavy silt loads, and other pollutants attributed to runoff.

5. Present problems will be greatly magnified in the future by projected population growth for the metropolitan area unless corrective measures are taken.

6. The difficulty of pollution abatement efforts for the upper estuary will be greatly increased unless effective intensified efforts are undertaken in the upper basin.

To enhance the quality and value of the water resources of the Potomac, and to assure adequate sewerage service for the metro area, the conferees recommend the following approaches:

1. The continuous application of the best available waste cleansing technology to provide the highest water quality which under no circumstances will be less than the approved water quality standards.

2. Effective coordination of all metro community area waste treatment and sewerage programs to achieve maximum ecnomies of scale.

3. Maximum application of practical measures for control of sediments from both the metropolitan area and the upper watershed.

4. Effective treatment of waste from Federal establishments, as well as wastes from industries,

oil handling facilities, and watercraft.

5. Further study of the Potomac Estuary to provide information needed for meeting problems associated with an expanded population and for the better understanding of the estaurine problem. These studies should indicate the possibilities for additional water supply and for low flow augmentation.

6. That the Federal, State and local governments continue their efforts to define and establish appropriate institutional arrangements; such as the Potomac River Basin Compact as proposed by the Potomac River Basin Advisory Committee.

To develop specific engineering and administration implementation procedures, the Conferees will recess for approximately two weeks to allow time for technical evaluation of the extensive data and suggestions developed by the Conference.

(Whereupon, at 3:30 p.m., an adjournment was taken.)

* * *

(The following was submitted for inclusion in the record:)

STATEMENT FOR THE RECORD OF THE CONFERENCE ON POLLUTION OF THE POTOMAC-WASHINGTON METROPOLITAN AREA ON APRIL 2, 1969 IN WASHINGTON, D.C.

The Northeast Region of the Bureau of Outdoor Recreation, U. S. Department of the Interior is concerned with the quality of the Potomac River water as it influences actions to meet the outdoor recreation demands of the river basin.

The Bureau is presently participating in a framework study of the water and related lands of the North Atlantic Region, which includes the Potomac River Basin. This agency's responsibility is to formulate a broad guide to the recreation use of water and related land resources of the region to meet the foreseeable needs to the year 2020.

Although our studies are far from complete, tentative findings indicate that by the year 2020 there could be a water-oriented outdoor recreation demand in the Potomac Basin of approximately 100,000,000 recreation days. In terms of the present day demand this represents an approximate three-fold increase. It is also clear that the existing recreation lands and facilities fall short of meeting the present demand. We are, therefore, faced with the burdensome task of not only overcoming an existing deficiency but also of accelerating our efforts to offset the rising rate of increase in demand. These tentative demand figures do not consider the total spectrum of outdoor recreation needs, but only those needs which are water dependent or water enhanced. This water-related demand is the figure that we are particularly interested in when discussing programs related to pollution abatement in the waters of the Potomac.

In attempting to develop plans for meeting the water-oriented recreation needs of the future we are also aware that a large portion of the total basin demand is being generated in the Washington Metropolitan Area. We estimate that about two-thirds of the residents in this area would be excluded from any recreation area that requires an automobile for access. Thus, we believe that additional acquisition and development of public waterfront areas along the Potomac and Anacostia Rivers and Rock Creek can be an important plan element for meeting the needs of the metropolitan area. The potential of the Potomac for meeting recreation demand is directly dependent upon the uses which may be made of the water and its related land. If the quality of the waters of the Potomac is not raised substantially then we will fall far short of achieving the recreation goals established by the Department of the Interior in its recently issued report The Nation's River.

We should also be aware that other ongoing programs of the States and the Federal agencies may directly influence actions under pollution abatement programs. For example, in administering the Land and Water Conservation Fund, BOR includes as allowable project costs a variety of pollution control facilities associated with recreation development. Such measures as sewerage treatment, erosion control and waste management are foremost. In addition, all grant applications are checked against applicable water quality standards to prevent degradation through recreation development and to assure that recreation development does not contribute to further pollution of waters already below the accepted standards.

We must continue to project new ideas into the planning for the Potomac River. Relatively long periods of time will be required to achieve the desired increase in the water quality of the Potomac. In the interim there is a significant resource which will be used for recreation purposes other than primary water contact activities. Responsible agencies should move to protect and promote these activities by the establishment of appropriate quality criteria.

The National Trails System Act of October 2, 1968 (P.L. 90-543), provides for study of Potomac Heritage Trail which would pass through the Washington metropolitan area on both shores of tne Potomac. "From Sea to Shining Sea, A Report on the American Environment" prepared by the President's Council on Recreation and Natural Beauty supported the Potomac Heritage Trail as part of the nationwide system offering appreciation of the physical environment through the simple rewards of walking.

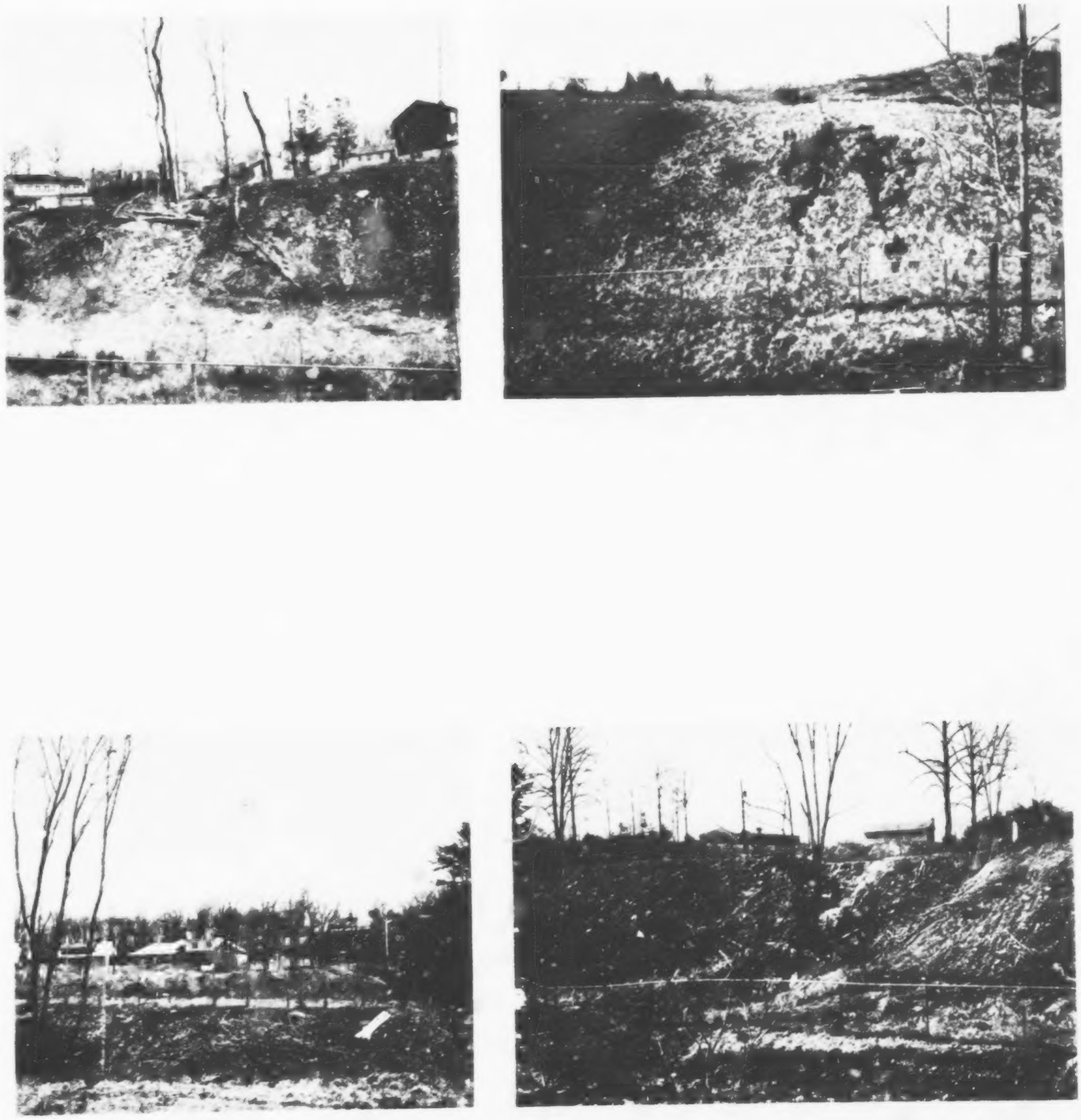
As the lead agency for study of Potomac Heritage Trail, BOR is concerned that the quality of a hike to, through or in the Nation's Capital is not overshadowed by the lack of quality in the waters beside which a good portion of that hike would take place. We would hope instead that Potomac Heritage Trail can provide examples of various environments along the way that are being improved rather than being deteriorated. To this end, improvement of water quality in the Potomac River is vital, particularly in the Capital area.

Of more direct concern is our responsibility in the course of the study to employ the expertise of all participating agencies to make certain that the trail itself does not contribute to pollution of the river. Sound planning will be required to select a maintainable location, control erosion and siltation during and after construction and provide sanitary facilities adequate for the anticipated use. It is expected that others will join us in making Potomac Heritage Trail a facility that does not degrade the Potomac or its valley.

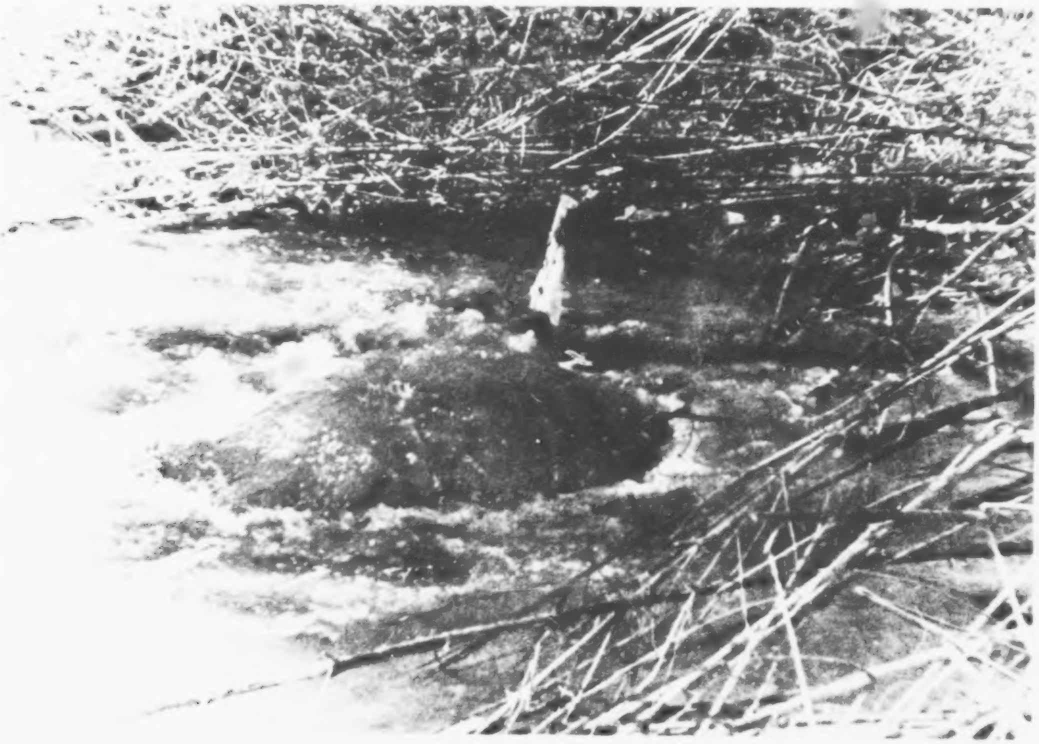
The Bureau believes it is important that we all be aware of the proposals and recommendations of the report of the President's Council on Recreation and Natural Beauty, "From Sea to Shining Sea". Many of these recommendations are directly related to the water pollution abatement programs, and they are all aimed at improving the quality of the environment.

* * *

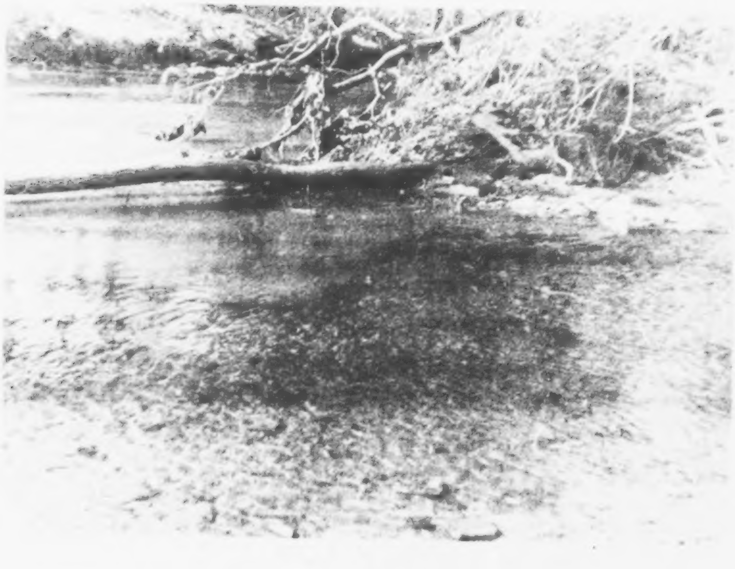
Cabin John Creek, Cabin John, Maryland. Sources of Pollution.
Submitted by the Cabin John Citizens' Association, April 3, 1969



Several views of construction along the Beltway with evidence of erosion which has not been controlled. The runoff from these sites is added to the Beltway runoff which is dumped into Cabin John Creek at the River Road exit of the Beltway.



Sewer overflow at the confluence of the east and west branch of Cabin John Creek.



Merging of sewage and natural stream water in Cabin John Creek, Spring 1969. Natural water in lower right, contaminated water in upper left.

IZAAK WALTON LEAGUE
(SEAL)
INDIANA DIVISION

THE IZAAK WALTON LEAGUE OF AMERICA
Incorporated
Defenders of Soil, Woods, Water and Wildlife

April 3, 1969

To: Federal Water Pollution Control Administration
Potomac River Basin Conference

Gentlemen:

I am pleased today to appear as a representative of the Indiana Division of the Izaak Walton League of America, a unit of a national organization of conservationists which includes nearly 6,000 men and women, more than 10% of the entire national membership of the League from coast-to-coast. My name is E. Eugene Minney, of Griffith, Indiana; and I am a member of both the national and Indiana Division water quality groups. Our statement has been specifically approved by both the Division President and Division Executive Secretary.

Izaak Walton League

It may seem strange, perhaps, that a Midwestern conservationist State organization would sponsor a witness to testify a third of a continent away concerning a river basin that many of our Indiana members may never see. But we are proud of the recent history of the Indiana Division, which has found our people deeply concerned and committed to the great conservation issues, wherever they may be deliberated. With that commitment deeply ingrained in the fabric of our State organization, we recognize that the "bell tolls" for all if it tolls for one, where environmental quality is concerned. Thus, the Indiana Division was directly represented in Denver, Colorado, in testimony for a National Wilderness Preservation System. It sent its spokesmen to Washington to defend the Grand Canyon. Today, I am only the third witness for the Indiana Division this week to appear before public bodies here in the Washington area. Yesterday, our Executive Secretary Thomas Dustin testified for funding of the Indiana Dunes National Lakeshore. Our State Secretary Wayne Stapf may still be here speaking for clean air.

But we have a special appreciation for the effort here to clean up the Potomac River Basin. It is, more than most rivers, a part of the American heritage. It is one of the Nation's most historic streams, and has seen all of the rise and growth of a Nation. It has carried the blood of patriots. But we have repaid its beauty and importance with the excrement of a civilization. Today, it is the blood of the slaughterhouse or packing plant which will be more likely found in it. It has been perhaps most polluted by the very seat of government, and is now unsafe for any use except more pollution.

This is little short of treason to the heritage of a Nation. Nor can it be excused on the political pretext that the problem has only recently become evident. As early as 1913, studies by the Public Health Service reported that the capacity of the Potomac to handle fetid effluents would be overtaxed; and it said treatment should be undertaken "in the near future." More than half a century later, we see the results of a pollution "over-kill" that would have been inconceivable in an earlier time -- but that is yet only a harbinger of what is to come if action fails now.

Such treatment facilities as were installed proved mainly inadequate. The year Franklin

Roosevelt was first elected President, the Potomac pollution was termed "critical," with almost twice the population pulling toilet chains than were flushing in 1913. Eleven years later, the population of the basin had doubled again, to over 1,000,000; and the river was receiving at least a third more feces and other organic pollutants than it did in 1932.

No more of this history need to be repeated for this record. It is a history for which the Nation can only accept shame. If a few examples of recent abatement action can be said to be encouraging, it can also be said to be overdue and still inadequate.

Let me say on behalf of the Indiana Division that we are as critical of desecrated water in the Hoosier State as we are here today. The lethal qualities of our Calumet Basin in my own region of Indiana, the thermal pollution of our utilities, the pesticide pollution of Lake Michigan, the nutrient load added to the headwaters of our Maumee River, have all come under the scrutiny and condemnation of our chapters and State organization. No special or governmental interest in Indiana stands screened from criticism of Indiana

Waltonians. I wanted this Conference to know this, and to understand that we do not come to make attacks and sermons here that we have not had the fortitude to deliver in our own State.

The Indiana Division of the League wholeheartedly joins the Virginia unit of our organization in criticism of inadequate quality standards as they apply to the Potomac Basin. We have applied intensive pressure in our own State to secure a non-degradation commitment from our own State officials, and we think it is the duty of the Commonwealth of Virginia, Maryland and the District of Columbia to adopt a non-degradation policy.

The quality of the Potomac Basin water relies upon many parameters, not the least of which are oxygen content, thermal levels, bacteriological content, and chloride concentrations. These and all other parameters should be built into a standard which provides for healthy, reproducing communities of warm water aquatic life, and for whole body recreational contact wherever public access can be provided. At no point should a quality less than partial body contact be permissible, and nowhere should any parameter be permitted to rise at all if it is presently below a value set in a tight water quality standard.

We in Indiana are looking with intense interest to the product of this conference, and to the implementation of acceptable recommendations it may make. If our country is not determined enough to stop fouling its environment at the seat of government, what are the prospects for halting the fire hazard of Ohio's Cuyahoga, Indiana's lethal Calumet, or New York's Hudson?

Let me add a few basic positions of the Indiana Division. We are flatly opposed to the myth that "dilution is the solution to pollution." We have formally resolved and actively defended our opposition to the inclusion of economic justification of Corps of Engineers and other dams on the strength of so-called "water quality control." "Dilution of treated effluents" -- as it is now called, does absolutely nothing but pass our problems on to future generations. There, they will be even more amplified than our present situation is over the warnings of 1913.

We urge our Government to abandon this false prophecy now, and to concentrate all of its attention on the only effort that can have any meaning: treatment of all polluted effluents at their source, in such a way that no discharge to any stream or publicly accessible or underground body of water will be of poorer quality than the standard set for the environment to which the discharge is released. In this, let me add, we regard thermal pollution on a par with all other parameters; we have amply protested the setting of thermal standards at 93°F. Aquatic biologists of world stature who are associated with the Izaak Walton League in Indiana, such as Dr. William Eberly of Manchester College, have flatly stated for the Record that 85°F should be the maximum permissible temperature for the overall life cycle of warm water aquatic life. We have so testified in every one of Indiana's 10 river basin hearings, and we reiterate that position here.

There is no doubt that some important efforts are being made by some of the communities of the Potomac River Basin. Perhaps some comfort can be taken from the statistics that while population doubles, pollution increases by only one-third. But the fact is that the recommendations of the Federal Enforcement Conference of eleven years ago on the Potomac Basin have not even been approached. The qualities are worse than ever, and grow worse even during this Conference.

Izaak Walton League

Almost within earshot, the Congress and the Administration of this country have written and committed great language to the law of the Nation with regard to environmental qualities in these and other waters. We have confidence that the commitments were made in good faith. But that good faith has not been kept by the people of the land yet; so we cannot look critically only upon our Representatives, Senators and President. We must look at each other, and in considerable shame; and we must ask ourselves why we have not risen up in revulsion at what we see and smell. But in the Potomac, we must also face the truth that if we fail to speak out and act at the heart of the Nation, then how and where will we find the spirit to act anywhere.

E. Eugene Minney
228 North Raymond Street
Griffith, Indiana

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THIRD SESSION

of

CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE POTOMAC RIVER AND ITS TRIBUTARIES

Washington Hilton Hotel

Washington, D.C.

May 8, 1969

Third Session of the Conference in the Matter of Pollution of the Interstate Waters of the Potomac River and its Tributaries, held at the Washington Hilton Hotel, Washington, D. C., on May 8, 1969, at 9:30 a.m.

PRESIDING:

Hon. Carl L. Klein, Assistant Secretary of the Interior for Water Quality and Research, Washington, D. C.

CONFEREES:

Mr. Murray Stein, Assistant Commissioner for Enforcement, Federal Water Pollution Control Administration, U. S. Department of the Interior, Washington, D. C.

Eugene T. Jensen, Regional Director, Middle Atlantic Region, Federal Water Pollution Control Administration, U. S. Department of the Interior, Charlottesville, Virginia

Paul W. McKee, Director, Maryland Department of Water Resources, State Office Building, Annapolis, Maryland

CONFEREES (Continued):

Thomas D. McKewen, Director, Bureau Resources Protection, Maryland State Health Department, 2305 N. Charles Street, Baltimore, Maryland

Carl J. Johnson, Executive Director Interstate Commission on the Potomac River Basin, 1025 Vermont Avenue, N.W., Washington, D.C.

David D. Dominick, Commissioner, Federal Water Pollution Control Administration, U. S. Department of the Interior, Washington, D.C.

Malcolm Hope, Associate Director, Office of Environmental Health, D.C. Department of Public Health, 1875 Connecticut Avenue, N.W., Washington, D.C.

Norman E. Jackson, Director, D.C. Department of Sanitary Engineering, District Building, Washington, D.C.

A. H. Paessler, Executive Secretary, Virginia State Water Control Board

CONFEREES (Continued:

George Carley, Assistant Executive Director, Interstate Commission on the Potomac River Basin, 1025 Vermont Avenue, Washington, D.C.

THOSE IN ATTENDANCE:

Johan A. Aalto, Chief, Chesapeake Technical Support Laboratory. FWPCA, Annapolis, Maryland

Keith G. Baker, Administrative Assistant to Hon. Wm. L. Hungate, M.C. (Missouri), 439 Cannon Building, Washington, D.C.

Edmund Baxter, Consultant, Suite 109, 1028 Connecticut Avenue, N.W., Washington, D.C.

L/Col. Herbert E. Bell, Staff Bioenvironmental Engineer, HQ USAF (AFMSPAP), Washington, D.C.

Pritam Singh Bhutani, Civil Engineer, Corps of Engineers, Baltimore District, 419 East 31st Street, Baltimore, Maryland

THOSE IN ATTENDANCE (Continued):

Robert N. Bodine, Jr., Consulting Engineer, 6210 Greeley Boulevard, Springfield, Virginia

John V. Brink, Chief, Bureau of Public Health Engineering, D.C. Department of Public Health, Washington, D.C.

William H. Cary, 9607 Glencrest Lane, Kensington, Maryland

Julie D. Danforth, Research Assistant, Natural Resources Policy Center, GWU, Room 810, 2100 Pennsylvania Avenue, N.W., Washington, D.C.

Robert V. Davis, Assistant Executive Secretary, Virginia State Water Control Board, Box 11143, 4010 W. Broad Street, Richmond, Virginia

J. W. Dixon, Consulting Engineer, 4651 24th Street, N., Arlington, Virginia

F. H. Doe, Jr., Director of Utilities, Arlington County, Virginia Court House, Arlington, Virginia

THOSE IN ATTENDANCE (Continued):

Mrs. Betty L. Dooley, Research Assistant, Robert Blum and Associates, 815 Connecticut Avenue, N.W., Room 516, Washington, D.C.

Richard J. Durgin, Engineering and Design Div. Engineer, City of Alexandria, P. O. Box 178, Alexandria, Virginia

Allan B. Fay, 6116 Overlea Road, Washington, D.C.

C. M. Fesler, Committee of 100 on Federal City, 1100 6th Street, S.W., Washington, D.C.

Carl D. Fetzer, U.S.D.A. Soil Conservation Service, Washington, D.C.

Paul V. Freese, Deputy Director, D.C. Dept. of Sanitary Engineering, Presidential Building, 12th and Pennsylvania Ave., N.W., Washington, D.C.

Stephen F. Gordon, Ensign, U. S. Coast Guard Baltimore Group, Coast Guard Yard, Baltimore, Maryland

THOSE IN ATTENDANCE (Continued):

Margery Gverin, Council of Governments,
1225 Connecticut Avenue., N.W., Washington,
D.C.

M. H. Gula, Chief, Sanitation Division,
Arlington County, Virginia Courthouse-
Room 213, Arlington, Virginia

Lt. Col. W. Gulevich, 1st U. S. Army,
Fort Meade, Maryland

A. W. Hadder, Director, Enforcement
Division, Virginia Water Control Board,
P. O. Box 11143, Richmond, Virginia

Charles R. Hall, Systems Analyst,
Maryland Department of Water Resources,
State Office Building, Annapolis, Maryland

N. A. Jaworski, FWPCA, Chesapeake Technical
Support Laboratory, Annapolis Science
Center, Annapolis, Maryland

Kenneth M. Karch, Environmental Health
Engineer, Metro Washington Council of
Governments, 1225 Connecticut Avenue, N.W.,
Washington, D.C.

THOSE IN ATTENDANCE (Continued):

Robert P. Keen, Executive Vice-President, Enviresearch Corporation, 1629 K Street, Washington, D.C.

John J. Lentz, Director, Health & Environmental Protection (ACTC), Metro Washington Council of Governments, 1225 Connecticut Avenue, N.W., Washington, D.C.

Claudia Levy, Reporter, Washington Post, 1515 L Street, N.W., Washington, D.C.

Gordon E. McCallum, Vice-President. Engineering-Science, Inc., 2600 Virginia Avenue, N.W., Washington, D.C.

James MacNees, Reporter, Baltimore Sun, Baltimore, Maryland

Hester P. McNulty, Chairman, Potomac Basin Inter-League Committee, League of Women Voters, 7528 Little John Court, Falls Church, Virginia

THOSE IN ATTENDANCE (Continued)

Charles Mooshian, Public Information Specialist, D.C. Department of Public Health, 1875 Connecticut Avenue, N.W., Washington, D.C.

David Moreland, Hercules Inc., 910 Market Street, Wilmington, Delaware

David R. Newman, Correspondent, McGraw-Hill, Inc., Washington, D.C.

Thomas L. Noel, Recreation Liaison Officer, Bureau Outdoor Recreation, RAS, Department of the Interior

Sylvester I. Olson, Director, Enforcement Program Division, FWPCA, Washington, D.C.

Charles D. Owens, President, Enviresearch Corporation, 5103 Davis Building, 1629 K Street, N.W., Washington, D.C.

J. Kelly Paull, Director, Operations Division, Department of Public Works, County of Fairfax, 4000 Chain Bridge Road, Fairfax, Virginia

THOSE IN ATTENDANCE (Continued):

Charles Pierce, Public Information Office, FWPCA, Washington, D.C.

Robert W. Pierce, Assistant to Chief Engineering Services, Maryland Department of Water Resources, Annapolis, Maryland

Paul W. Reed, Chairman, Program Planning and Rev., D.C. Department of Sanitary Engineering, 12th and Pennsylvania, Washington,D.C.

Howard L. Rhodes, Environmental Health Engineer, 1st USA Medical Laboratory, Ft. George G. Meade, Maryland

Edith Ray Saul, Water Resources Chairman, League of Women Voters of D.C., 3632 Prospect Street, N.W., Washington, D.C.

Jodie Scheiber, Conservation and Natural Resources Subcommittee, B 349-C Rayburn House Office Building, Washington, D.C.

Melvin E. Scheidt, Consultant, Maryland State Health Department, Highland, Maryland

THOSE IN ATTENDANCE (Continued):

Harvey L. Segal, Civil Engineer, HQ USAF, AFOCEKD, Bolling AFB, Building 626, Washington, D.C.

Lucy W. L. Seligson, Program Advisor USDI, FWPCA, Office of Enforcement, Washington, D.C.

S. W. Shafer, Engineer-Director, Alexandria Sanitation Authority, 835 So. Payne Street, Alexandria, Virginia

Arnold Speiser, Chief, Water Quality Control Division, D.C. Department of Public Health, 801 N. Capitol Street, N. E. Washington, D.C.

Philip N. Storrs, Vice-President, Engineering-Science, Inc., 4316 Telegraph Avenue, Oakland, California

John C. Toomer, Engineering Technician, Bureau Public Health Engineering, 801 N. Capitol Street, N.E., Washington, D.C.

THOSE IN ATTENDANCE (Continued)

Dr. Arno Viehoever, Civic Congress of S. Prince Georges County & Broad Creek Citizens Association, 11001 Mariner Drive, Oxon Hill, Maryland

G. T. Williams, Director, Urban & Pollution Programs, Systems Research Corp., Washington, D.C.

Stephanie White, Monsanto Co., 1101 17th Street, N.W., Washington, D.C.

Janet B. Wilson, Information Officer, Potomac River Basin Advisory Committee, Room 1104, 1025 Vermont Avenue, N.W., Washington, D.C.

Thomas F. Wilson, Attorney, 520 N Street, N.W., Washington, D.C.

Jeffery L. Yarne, Cpt. MSC, First Army Surgeon, First U. S. Army Medical Lab, Ft. George Meade, Maryland

Clem L. Zinger, Administrative Assistant, Potomac Basin Center, 1250 Connecticut Avenue, N.W., Washington, D.C.

SECRETARY KLEIN: Gentlemen, we are a little bit late in coming to order.

I am Assistant Secretary Carl Klein, of course, and Chairman of the Conference. Mr. Murray Stein is my Vice-Chairman on this and will take over when I have to leave this morning.

We have with us representatives from the Washington, D. C. district, from the Washington Suburban Sanitary Commission, from the State of Virginia, from the State of Maryland, and from the Interstate Commission on the Potomac River Basin.

We met here approximately a month ago and had three days of hearings. As a result I have prepared a statement and I would like to read it to you today, for those of you who do not have copies of it.

We are reconvening the Potomac River Conference today to consider recommendations of the conferees and to begin planning for the actual cleanup of the river.

The startling revelation of coliform counts up to 1,500,000 instead of the danger zones of 1,000 to 5,000 on coliform counts coupled with our projections of population of 7,700,000 or 9,000,000 in future years can only mean that this problem must be met now to protect both the present and the future.

Secretary of the Interior Walter J. Hickel has called for a cleaning up of the river. Our President, Richard M. Nixon, has stated:

> "All pollution, in one form or another, violates the rights of individuals."

The question is: How do you do this? How much does it cost?

The solution is in meeting the new standards proposed for removal of suspended and dissolved solids and nutrient pollutants as recommended by the conferees. The technique is what I refer to as exotic tertiary treatment of the type utilized by the Blue Plains pilot plant. The result is almost comparable to many of our present drinking water supplies.

The cost--you can express it as a horrible $500 million package. I prefer to let people know it as the cost to each family--this is where it affects the family pocketbook. The testimony here in April was: The extra cost would be $1.00 per family per month in extra user charges. This is entirely reasonable and I am sure it is acceptable to the entire Potomac.

Gentlemen, we know the results of inefficient sewage treatment. We get a bottom of gook and unusable water.

The problems have been analyzed; the solutions proposed are now before you; the implementation is before us.

There will be no ten-year delay in between this and our next conference. When we adjourn, it will be to resume again on November 6, 1969, at 9:30 a.m., in the Statler Hilton here in Washington to discuss progress reports and to require all concerned to prepare interim reports to be submitted by October 9, 1969 to the Regional Office of the Federal Water Pollution Control Adminstration at Charlottesville, Virginia. This technique of progress reports and implementation will be kept on the six-month schedule until the job is complete--and the Nation's river is the prime example of what a river can be.

In other words, we are going to keep after the job and it is not going to slip away from us. It cannot. The river is in too bad a shape now.

Despite everything that we thought we were doing properly in the past, we now realize that our scientific implementation was not good enough and that something better must be done.

At this time, I would like to call on Mr. Gene Jensen, who is our Regional Director from Charlottesville, Virginia, to present the recommendations of the Federal Water Pollution Control Administration.

I may say to the people who are here, all of these recommendations or the wording thereof have not yet been agreed upon in toto by all of the conferees, and there may be discussions. Mr. Jensen.

MR. JENSEN: Mr. Chairman, following the first session of this conference, the Regional Office Staff reviewed the extensive data and recommendations which had been presented.

We attempted to put these then into the form of a series of recommendations which would implement the original broad recommendations of the conferees for a program which would clean up the Potomac and which would keep it clean.

We have drafted a series of recommendations. We have met individually, I believe, with each of the conferees, with the possible exception of Mr. McKee. These recommendations have changed almost daily as a result of these conferences, but we have not, up to this time, had a chance for all of us to sit down together and discuss this draft at one time.

Mr. Chairman, I would like to have these recommendations we have developed made a part of the record.

SECRETARY KLEIN: So ordered.

(The following are the recommendations referred to by Mr. Jensen:)

RECOMMENDATIONS

In order to enhance the quality and value of the water resources of the Potomac River and tributaries in the Washington Metropolitan Area and to abate water pollution, it is recommended that:

1. Waste treatment facilities now discharging to the Potomac River between river mile 106 and river mile 91 be improved to achieve 96 per cent removal of BOD and phosphorus that will limit loadings as follows:

	lbs/day	
Facility	BOD_5	Tot. P
Pentagon	300	20
Arlington	1,300	60
District of Columbia	12,700	560
Alexandria	1,300	60
Fairfax Westgage	900	40
	16,500	740

Ammonia nitrogen in the effluents of each of the above plants shall be substantially zero. No new discharges or increased loadings between river mile 106 and river mile 91 will be approved, without the concurrence of the conferees.

Construction schedules for the above plants are as follows:

Facility	Preliminary Completed	Final Plans	Commence Construction	Operational
Pentagon STP	4/1/70	4/1/71	8/1/71	8/1/73
Arlington, Va.	3/1/70	3/1/71	7/1/71	7/1/73
District of Columbia Blue Plains*	5/1/70	8/1/71	1/1/72	1/1/75
*Interim Schedule for 90% Removal	7/1/69	3/1/70	7/1/70	7/1/72
Alexandria, Va.	3/1/70	3/1/71	7/1/71	7/1/73
Fairfax Westgate	3/1/70	3/1/71	7/1/71	7/1/73

The below listed treatment plants are to provide 96 per cent BOD removal and 96 per cent phosphorus removal. Construction schedules are as follows:

Facility	Preliminary Completed	Final Plans	Commence Construction	Operational
Charles Co., Md. Mattawoman Creek	3/1/70	3/1/71	7/1/71	7/1/73

Fairfax Co.				
Dogue Creek	1/1/70	10/1/70	2/1/71	8/1/72
Little Hunting Creek	1/1/70	10/1/70	2/1/71	8/1/72
Accotink-Pohick	3/1/70	3/1/71	7/1/71	7/1/73
Andrews AFB*				
STP #1	3/1/70	3/1/71	7/1/71	7/1/73
STP #4	3/1/70	3/1/71	7/1/71	1/1/73
Fort Belvoir				
STP #1	3/1/70	3/1/71	7/1/71	1/1/73
STP #2	4/1/70	4/1/71	8/1/71	8/1/73
Naval Comm. Sta.*	1/1/70	10/1/70	2/1/71	3/1/72

*These installations should, as an alternative, explore the possibility of connecting to other sewage systems serving their area.

2. Continuous and effective effluent disinfection be practiced at all sewage treatment plants immediately so as to effect a reduction in fecal coliform bacteria to a level in the effluent not in excess of the water quality standards.

3. The following industries are to comply with orders of the Maryland Department of Water Resources for completion of treatment facilities by January 1, 1970:

Industry: Inland Materials Sand & Gravel; Clinton, Maryland; Receiving Waters, Tinkers Branch;

Industry: Potomac Sand & Gravel Corp., Greenway Flats; Receiving Waters, Potomac River;

Industry: Silver Hill Sand & Gravel Co. Silver Hill; Receiving Waters, Henson Creek;

Industry: A. H. Smith Sand & Gravel, Branchville; Receiving Waters, Indian Creek;

Industry: Devlin Lumber & Supply Co., Rockville; Receiving Waters, Crabs Branch;

Industry: Metropolitan Fuels Co., Bethesda; Receiving Waters, Little Falls Branch;

Industry: Mineral Pigments Corp., Muirkirk; Receiving Waters, Indian Creek;

Industry: Arundel Supply Co., District Heights, Receiving Waters, Southwest Branch;

Industry: Banning Plymouth, Inc., Hyattsville; Receiving Waters, Northeast Branch.

The Potomac Electric Power Company, the District of Columbia, and the FWPCA will jointly evaluate the effects of heated waters on the Potomac and Anacostia Rivers and report results together with recommendations for any required corrective actions to the conferees by

January 1, 1970.

4. The agencies represented by the conferees cooperate in a detailed engineering analysis of alternate methods of meeting future sewerage needs in the Metropolitan Area. This analysis must consider probable advances in waste treatment technology; space limitations which prevent unlimited expansion of the District of Columbia water pollution control plants; fail-safe sewer systems to prevent raw sewage discharges; possibilities for load transfers to other sewage treatment plants; opportuniites for use of reclaimed water; sewers and alternate treatment plants and discharge points for treatment facilities and sludge disposal methods needed for the expanding Washington population. The study shall be completed by January 1, 1971, and a report and recommendations submitted to the conferees.

5. The District of Columbia complete their project C for elimination of combined sewer overflows by 1970. The State of Maryland take action to eliminate pollution from sources in Maryland on Rock Creek and the Anacostia River. Alexandria eliminate pollution from combined sewer overflows by 1972. Plans for elimination of bacterial pollution from stormwater be developed

and a preliminary report be submitted to the conferees at the next progress meeting. The District of Columbia plan for elimination of combined sewers be updated to reflect an accelerated program.

6. The planned advanced waste treatment plant at Piscataway be constructed as soon as possible.

7. The appropriate State, county and municipal agencies take action to correct pollution from septic tanks and raw discharges in the counties of the conference area.

8. The counties in the conference area and the District of Columbia adopt and enforce effective ordinances for the control of soil erosion.

9. The Secretary of the Interior request the Secretary of the Army to have the Corps of Engineers install and maintain a log boom or similar device on the Potomac and Anacostia Rivers upstream from Washington for the purpose of preventing floating logs and other debris from washing into the estuary.

10. A committee of representatives of the Federal and State regulatory agencies be established to make a joint survey of oil storage areas, terminals, and oil pollution from vessels and make recommendations to the

conferees by June 1, 1970, for actions required to minimize the possibility of pollution by oil and other petroleum products.

11. The National Park Service provide areawide leadership for a program designed to keep the shores of the Potomac and its tributaries free of debris and litter. Elements of this program should include:

--a continuing program for the cleanup of shoreline debris and litter including "Operation Clean Waters" as conducted by the D.C. Neighborhood Youth Corps.

--a review of each park agency's operating procedures with a view to modifications which will minimize the amount of debris and litter which may enter the Potomac and its tributaries.

--a public information program to obtain maximum citizen participation.

--appropriate coordination with the Corps of Engineers.

The National Park Service is requested to report to the conferees on the established and continuing progress of the areawide program at each scheduled public progress meeting.

12. The FWPCA coordinate a surveillance program that will include stream monitoring, efficiency of sewage treatment plant operations, and the effectiveness of sediment control programs.

13. The States develop uniform regulations for controlling pollution from watercraft unless enactment of Federal law makes this unnecessary.

14. A joint study by the appropriate State and Federal agencies be made of the Potomac Basin upstream from the conference area to determine what pollution controls will be required to protect the estuary. The conferees emphasize that protection of the investment of Washington area communities in waste treatment facilities and enhancement of water quality in the estuary requires continuing cooperation of Upper Basin communities, landowners and official agencies.

15. Public progress meetings be held on the first Tuesday of April and October of each year at which time status reports will be submitted on each of the foregoing recommendations.

MR. JENSEN: Mr. Chairman, I believe that the most appropriate or convenient method for discussing these would be to take them up one at a time. They have each been prepared on a separate sheet of paper. If we do make any changes that we believe might be necessary, we have typists and Xerox machines available so that we could prepare an immediate draft.

I believe that my discussions have indicated that the counties are in general agreement on the need for a very high level of waste treatment in the Potomac and for a planning program which will assure that in the future we will have adequate waste treatment.

They also, I believe, recognize that the Washington Metropolitan Area must be considered in its proper perspective to the upper basin.

That is, waste treatment practices and erosion control in the upper basin also affect this area.

SECRETARY KLEIN: Mr. Jensen, I will let you know that our division has already started work on the upper basin, and we are not going to let this get away from us either.

I have had talks with Mr. Coulter of Maryland about some of the problems he has up there, and we are going to implement this with the additional technique of getting the upper basin straightened out so that the whole river comes into focus and not just part of it.

I have also been talking with Mr. Johnson about this in order that he bring his Commission into this picture with Interior and that we keep the whole picture rolling together.

MR. JENSEN: Mr. Chairman, I think that this is absolutely imperative that we consider the entire river, but it is fortunate that we are able to start here.

I would recommend that we now take these items up one by one, starting with the first recommendation that deals with the provision of a very high level of waste treatment for the Washington area, currently 96 percent removal of BOD, total phosphorus, removal of nitrogen, with a further provision that treatment be upgraded in the future so that total loading limits as indicated in our recommendation #1 will not be exceeded.

SECRETARY KLEIN: Are there any comments by the conferees?

MR. JOHNSON: Are we talking strictly on levels now, or are we talking time schedules?

SECRETARY KLEIN: Let's talk to levels first so that we may break them down properly.

MR. McKEWEN: Mr. Chairman, Maryland has examined this recommendation, and Mr. Charles Hall of the Department of Water Resources has made an analysis of this and also an alternate, which we think might give better results.

At this time, we would like to have him present his information.

SECRETARY KLEIN: So be it.

MR. HALL: I really wasn't particularly ready to present this orally.

SECRETARY KLEIN: Could you give us a breakdown on it and put the whole thing into the record?

MR. HALL: Right. Do you want me to read this whole thing?

SECRETARY KLEIN: No, I would rather that you give us the breakdown.

MR. HALL: A brief summary?

SECRETARY KLEIN: A brief summary, please.

MR. HALL: All right.

In my view and analysis of the problem, particularly within the metropolitan region as defined by the Conference area, if we direct our attention to those aspects of the problem that affect the dissolved oxygen or the water quality of the estuary itself rather than those aspects of the problem that are more localized and have more localized effect, such as oil spills, raw sewage discharges from combined sewers, and this sort of thing--if we direct our thought for a moment towards the significant portions of the problem in the estuary that affect the overall water quality of the estuary, in doing this it might be easier for me just to read a few of these items which are fairly brief, particularly with relation to the BOD loading and the treatment removal requirements.

According to data published by the FWPCA, the major points of pollution load contributing to these conditions--that is, the general water quality degradation conditions--is that applied by the effluent from the District of Columbia's wastewater treatment plant located at Blue Plains. This load is responsible for 95 per cent of the critical oxygen deficit due to point-source loadings and 66 per cent of the total phosphorus loading to the upper estuary.

Utilizing a mathematical model developed by the FWPCA, it can be shown that the main control point for the low dissolved oxygen in the estuary, and for the excessive algal growth as well, is the effluent from the D. C. plant. Significant improvements in the dissolved oxygen concentration and excessive algal growth problem cannot be made without making a major change in either the location of the D. C. outfall, the size of the load discharged, or both.

Citing data presented by the Federal Water Pollution Control Administration but in the opinion of the Department of Water Resources "undersold" to the conferees, the greatest percentage of the oxygen-demanding properties of the D. C. effluent is due to the nitrification of ammonia and organic nitrogen. This, of course, is to be expected, since conventional biological treatment is designed to remove a percentage of the carbonaceous, or first stage BOD, leaving the nitrogenous material to be oxidized in the receiving water. This type of design for wastewater treatment is adequate for receiving water systems having the appropriate physical and biological morphology to accommodate both nitrogenous oxygen demand and the resulting nitrate load. Unfortunately, due to the long residence time, the magnitude of the load, and the suitability of the environment to the growth of algae, the Potomac Estuary, at the existing point of discharge for District of Columbia wastes, is not such a system. Furthermore, the removal of phosphorus alone from sewage effluents, without the reduction of the large quantities of nitrogen discharged, is still of questionable value to the control of algae in estuaries receiving large volumes of treated municipal wastes.

Since the removal of nitrogen is a necessary step for controlling the dissolved oxygen problem (a problem for which legal water quality standards exist) and may also produce a desirable algal response, it is suggested that nitrogen removal receive priority in large scale tertiary treatment systems. However, systems so designed should be adaptable to the subsequent addition of a phosphorus reduction process.

This is essential information with regard to the importance that we feel nitrogen removal has in the overall water quality of the estuary.

I might go ahead and--

SECRETARY KLEIN: Thus far, you have called for nitrogen removal to be added to the standards.

MR. HALL: No, nitrogen removal to be added as a requirement for the control of dissolved oxygen general standards.

SECRETARY KLEIN: Well, that is what I said.

MR. JENSEN: We have that in the recommendations.

MR. HALL: You have in your first recommendation included that this means removal of nitrogen.

SECRETARY KLEIN: I see here you missed it,but it states:

> "Ammonia nitrogen in the effluents of each of the above plants shall be substantially zero."

MR. HALL: I think what I am doing is confirming this recommendation,which was not brought out in the conference prior to this.

MR. JENSEN: This recommendation was added at Mr. Coulter's suggestion.

Originally, we had a table showing total nitrogen levels, and it was his feeling that it would be better to use this approach rather than the table which showed total nitrogen, but we had felt from the very beginning of the conference, and I believe documented it in the conference, that nitrogen removal was necessary to control excessive algal growths in the estuary.

MR. HALL: We are concurring with this,

and we would like to underline it, I think, in what I have said.

SECRETARY KLEIN: Well, it is not just at the Washington, D.C. plant; it is at all plants.

MR. HALL: It is at all plants, but I am saying this with reference to the major control point. That is, you can't correct the dissolved oxygen problem in the estuary without doing something to the D.C. plant.

SECRETARY KLEIN: We understand that they have a terrific load from the whole D.C. area including all of Dulles and everything else.

MR. HALL: Right.

SECRETARY KLEIN: In order to keep it out of our drinking water upstream, and we know that they have a problem and we know they have to expand, and they are having problems with that, too.

MR. HALL: And I think that what we are trying to say is that rather than to develop processes on a basis of a five-day BOD criteria, we develop treatment processes to remove specified quantities of the carbon and nitrogen components of the five-day BOD.

We have talked in terms of 96 per cent removal of the five-day BOD, but the five-day BOD represents generally about 68 per cent of the total first stage BOD, so if you removed all of the five-day BOD, you would still have a carbonaceous factor there; and I think as a second suggestion, it would be that we speak in terms of removing a percentage of the total carbonaceous oxygen demand.

SECRETARY KLEIN: As I see it thus far, you have added nothing new except on a technical basis, so I guess that's about it, is it not, Mr. Jensen?

MR. JENSEN: Yes, it is an important consideration.

We originally had this in an earlier draft, TOC removal, and had taken it out of this simply to really simplify the recommendations in here.

We realized that these relationships exist, and I think it is appropriate for the record to show this.

SECRETARY KLEIN: All right.

Now, will you summarize the rest of your recommendations, please?

MR. HALL: Well, the rest of my recommendations, in summary, and I won't go back over the ammonia nitrogen removal, is that the demonstration project for the Washington Suburban Sanitary Commission plant located on Piscataway Creek be authorized by the FWPCA and expanded to include nitrogen removal as specified for the D. C. plant.

This plant should then be completed and put into operation at the earliest possible date. The response of the algal system in Piscataway Bay should then be observed under conditions of substantially reduced nutrient (both phosphorus and nitrogen) loadings.

The third recommendation is: Concurrent with the implementation of recommendations 1 and 2 above, 1 dealing with the ammonia removal and 2 with the demonstration project of Piscataway Bay, that in cooperation with State and local jurisdictions, the FWPCA initiate studies to determine the most economic, efficient and effective combination of waste treatment, low flow augmentation and outfall location to meet the long-range water quality control needs of the estuary.

MR. JENSEN: Your recommendation No. 2 was also discussed with Mr. Coulter and we have a recommendation No. 6 which calls for essentially the construction of this advanced waste treatment plant at Piscataway Bay at the earliest possible date.

We also have a recommendation in here in slightly different words, which does call for this continuing study of the estuary to determine how we may use these various techniques, so I believe we are compatible.

MR. HALL: The only difference was that I would have suggested the addition of nitrogen removal to the Piscataway plant.

MR. JENSEN: Yes.

MR. HALL: And fourth, until such time as recommendations 1 and 2 have been completed and the resulting water quality improvements evaluated, all other organic wastes discharging to the estuary or tributaries should be provided with sufficient treatment to reduce the five-day BOD to 20 milligrams per liter or less, with provision for--and this would include space and suggested process design--nutrient removal facilities should they be found to be necessary with the increasing waste volumes of a rapidly increasing population.

In other words, I think that I am emphasizing, not from a technical standpoint, not from a political standpoint, the importance of the large volume of wastes generated and discharged in the D.C. area at this time, and that this action be begun as soon as possible, and then observations made.

MR. JENSEN: I believe this is compatible with our recommendation, and you are, in a sense, seconding the recommendation that we have here.

MR. HALL: Perhaps it is premature.

MR. JENSEN: And you may have further comments on subsequent recommendations.

(The following document was submitted by Mr. Hall for inclusion in the record:)

POTOMAC RIVER WASHINGTON METROPOLITAN AREA ENFORCEMENT CONFERENCE

Specific Engineering Recommendations As Per Conferees Request as Stated in the Recommendations Resulting from The Executive Session

May 8, 1969

SUGGESTED COMMENTS AND RECOMMENDATIONS FOR POLLUTION ABATEMENT NEEDS IN THE UPPER POTOMAC ESTUARY

Oil spills, combined sewers, sediment, inadequate pumping stations, debris, industrial and municipal wastewater treatment plant discharges, and algae, all go together to present a very complicated picture of water pollution in the Metropolitan Area. When the effects and possible solutions for these problems are included, the complexity of the problem is greatly increased. To arrive at a more workable unit on which to focus our attention, it is suggested that a line be drawn between those elements of the total picture that produce widespread effects in the Potomac Estuary and those whose effects are more localized in space or time. Since the present suggestions and observations are directed to those elements having a widespread significance to the estuary, the latter group will be considered to include such problems as oil spills, combined sewer discharges, pumping station failures, debris, erosion, etc.

It is important to realize, however, that a satisfactory condition cannot be achieved in the Metropolitan Area without the correction of all of these problems. The emphasis of the following comments is not intended to suggest priorities. Although it would be possible to correct the dissolved oxygen problem in the Potomac Estuary without correcting the problem of raw sewage discharges from combined sewers, oil spills, etc., the results from this effort alone would not produce satisfactory conditions in the area. Conversely, if raw sewage discharges were eliminated without correcting the low DO problem, the resulting conditions would still be unacceptable.

With the above definition of scope, the following comments express the Department of Water Resources' assessment of the estuary problems and recommends an action program. The assessment portion magnifies some important fundamental aspects of the estuary pollution problem that have either not been given adequate attention or have become obscured in past efforts to be all inclusive in presenting information and making recommendations for the Metropolitan Area.

Assessment of the Estuary Problem

1. In spite of considerable abatement activity, serious water quality degradation as measured by dissolved oxygen, bacteria and algal growth still persist during much of the year over a large portion of the Potomac Estuary in the Metropolitan Area.

2. According to data published by the FWPCA, the major point-source pollution load contributing to these conditions is that supplied by the effluent from the District of Columbia's wastewater treatment plant located at Blue Plains. This load is responsible for 95 per cent of the critical oxygen deficit due to point-source loadings and 66 per cent of the total phosphorus loading to the upper estuary.

3. Utilizing a mathematical model developed by the FWPCA, it can be shown that the main control point for the low dissolved oxygen in the estuary, and for the excessive algal growth as well, is the effluent from the D.C. plant. Significant improvements in the dissolved oxygen concentration and excessive algal growth problem cannot be made without making a major change in either the location of the D.C. outfall, the size of the load discharged, or both.

4. Citing data presented by the Federal Water Pollution Control Administration but in the opinion of the Department of Water Resources "undersold" to the conferees, the greatest percentage of the oxygen demanding properties of the D.C. effluent is due to the nitrification of ammonia (NH_3) and organic nitrogen. This, of course, is to be expected, since conventional biological treatment is designed to remove a percentage of the carbonaceous, or first stage BOD, leaving the nitrogeneous material to be oxidized in the receiving water. This type of design for wastewater treatment is adequate for receiving water systems having the appropriate physical and biological morphology to accommodate both nitrogenous oxygen demand and the resulting nitrate load.

Unfortunately, due to the long residence time, the magnitude of the load, and the suitability of the environment to the growth of algae, the Potomac Estuary, at the existing point of discharge for District of Columbia wastes, is not such a system. Furthermore, the removal of phosphorus alone from sewage effluents, without the reduction of the large quantities of nitrogen discharged, is still of questionable value to the control of algae in estuaries receiving large volumes of treated municipal wastes.

Since the removal of nitrogen is a necessary step for controlling the dissolved oxygen problems (a problem for which legal water quality standards exist) and may also produce a desirable algal response, it is suggested that nitrogen removal receive priority in large scale tertiary treatment systems. However, systems so designed should be adaptable to the subsequent addition of phosphorus reduction process.

The problem of the nitrogenous BOD has at least two additional ramifications that accentuate the need to focus attention of this source of oxygen depletion. Both of these have to do with the nature of the biological reactions involved.

(a) The Department of Water Resources'

experience with nitrification on the Patuxent River as well as studies made by other investigators, clearly indicate that the reaction rates for the biological oxidation of NH_3 nitrogen to nitrate (NO_3) nitrogen are much higher than those commonly reported for the carbonaceous stage. These high rates of oxygen depletion in an estuarial system having relatively low rates of atmospheric reaeration, would be expected to result in a more severe dissolved oxygen depression than would lower reaction rates associated with the carbonaceous demand.

(b) FWPCA engineers have rightfully calculated ultimate oxygen demand loadings on the basis of the nitrogen and carbon waste components and then converted the figures back to the five-day BOD equivalent. Treatment recommendations are then made on the basis of reducing the five-day BOD to some calculated acceptance level. Our experience on the Patuxent River has been that the analytical results from the five-day BOD test do not adequately reflect the nitrification process. Eckenfelder has shown that nitrification is seriously impaired when the dissolved oxygen content is less than 3.0 ppm, a condition that may exist in the BOD bottle for a portion of the incubation period. The test, also, does not reflect any acceleration of the initiation of nitrification attributable to an advanced seed stage in the river. This advanced seed condition may not exist in the BOD dilution water. The use of BOD dilution water seeded with river water may eliminate this possible source of misinterpretation.

The main point is that treatment processes should be designed to remove calculated percentages of the carbon and nitrogen components of the BOD tailored to the biomechanics and hydrodynamics of the receiving waters.

5. Figure 1, attached, graphically depicts

the capacity of the Upper Estuary to assimilate BOD load relative to the location of the discharge point. This graph was obtained using the previously mentioned mathematical model and computing the effects of a constant BOD load, varying the discharge point. As would be expected for an estuary having an increasing cross-sectional area in the downstream direction, the severity of the DO response becomes less as the discharge location is moved downstream.

Important to note is the magnitude of the oxygen deficit due to benthic demand, particularly in the portion of the estuary that presently receives the bulk of the wastewater discharge. Even without any external additions of BOD, it appears that the dissolved oxygen in this area would be depressed by the benthic demand nearly alone to the standard of 5.0 ppm. This condition considerably reduces the assimilative capacity of the estuary in the vicinity of Blue Plains.

6. Figure 2 was constructed from data generated by the FWPCA on the above referenced mathematical model. It can be seen from an examination of these curves that, for the existing location of the D. C. wastewater treatment plant outfall, low flow augmentation benefits as expressed by unit oxygen increase per unit

increase in flow, decrease markedly at flows greater than about 2,000 cfs.

Recommendations for the Control of Dissolved Oxygen and Eutrophication in the Potomac Estuary

1. In order to maintain the dissolved oxygen standards as established in the estuary, the treatment processes at the D. C. wastewater plant at Blue Plains should be modified and expanded in the immediate future to:

   (a) Achieve a minimum 90 per cent reduction in the first stage or carbonaceous BOD.

   (b) Remove essentially all of the ammonia nitrogen and as much of the organic nitrogen as is technologically feasible. Process design selected should minimize the amount of nitrite and nitrate oxygen discharged to the estuary.

   (c) Reserve the capability to provide the removal of phosphorus as may be necessary to prevent algal growths.

2. The demonstration project for the WSSC plant located on Piscataway Creek be authorized by the

FWPCA and expanded to include nitrogen removal as specified for the D.C. plant. This plant should then be completed and put into operation at the earliest possible date. The response of the algal system in Piscataway Bay should then be observed under conditions of substantially reduced nutrient (both phosphorus and nitrogen) loadings.

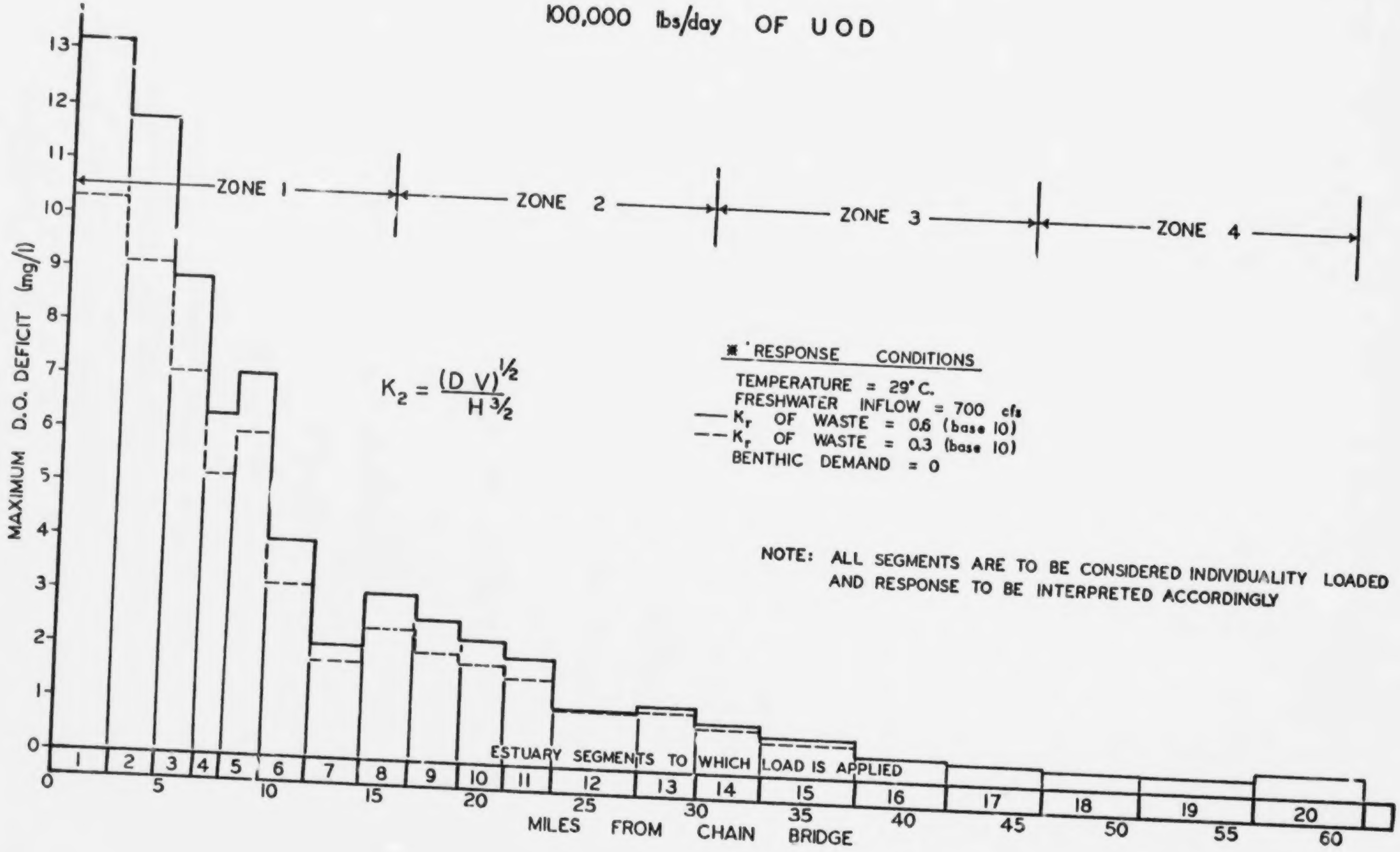
3. Concurrent with the implementation of recommendations 1 and 2 above, the FWPCA, in cooperation with State and local jurisdictions, should initiate studies to determine the most economic, efficient, and effective combination of waste treatment, low flow augmentation and outfall location to meet the long range water quality control needs of the estuary.

4. Until such time as recommendations 1 and 2 above have been completed and the resulting water quality improvements evaluated, all other organic wastes discharging to the estuary or tributaries, should be provided with sufficient treatment to reduce the five-day BOD to 20 mg/l or less with provision for (space and suggested process design) nutrient removal facilities should they be found to be necessary with the increasing waste volumes of a rapidly increasing population.

* * *

Fig. 1
Part 1

D.O. DEFICIT RESPONSE *
of
UPPER POTOMAC ESTUARY
for
SINGLE POINT APPLICATIONS
of
100,000 lbs/day OF UOD



$$K_2 = \frac{(D\ V)^{1/2}}{H^{3/2}}$$

* RESPONSE CONDITIONS

TEMPERATURE = 29° C.
FRESHWATER INFLOW = 700 cfs
— K_r OF WASTE = 0.6 (base 10)
-- K_r OF WASTE = 0.3 (base 10)
BENTHIC DEMAND = 0

NOTE: ALL SEGMENTS ARE TO BE CONSIDERED INDIVIDUALITY LOADED AND RESPONSE TO BE INTERPRETED ACCORDINGLY

Fig. 1
Part 2

D.O. DEFICIT RESPONSE*
of
UPPER POTOMAC ESTUARY
to
BENTHIC DEMAND

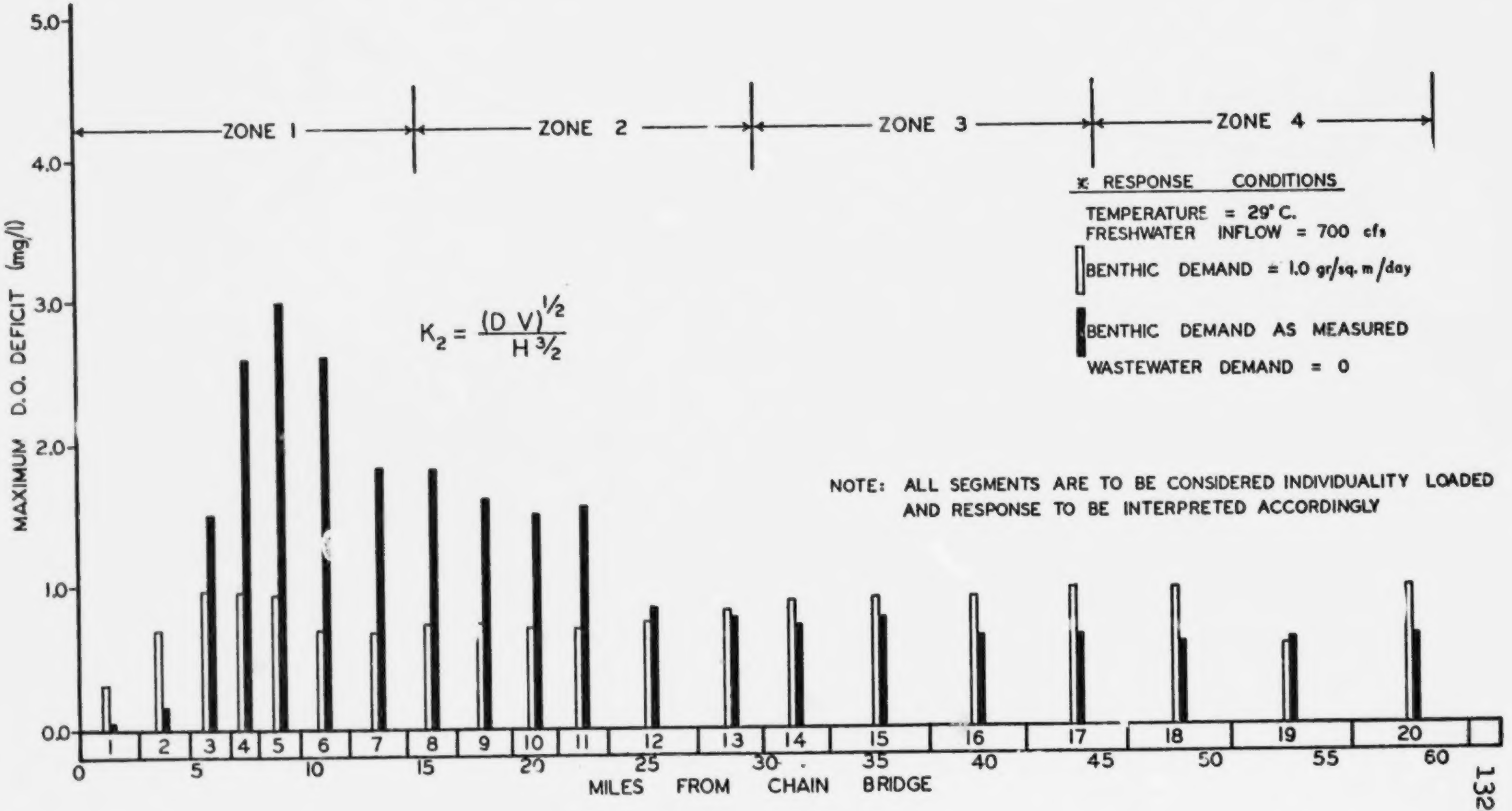
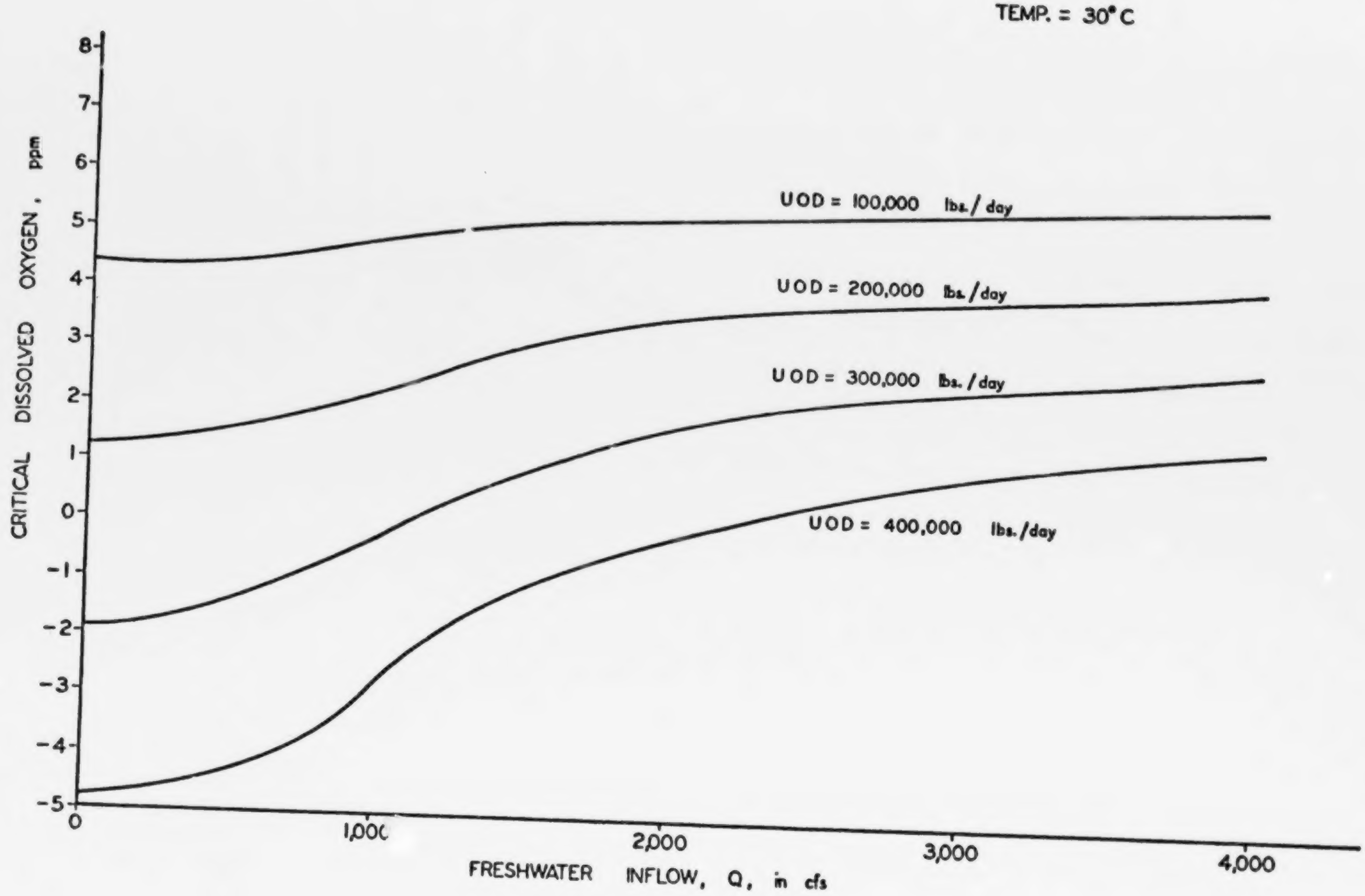


Fig. 2

POTOMAC ESTUARY

CRITICAL D.O. RESPONSE TO FLOW AUGMENTATION



SECRETARY KLEIN: Mr. McKewen, anything further?

MR. McKEWEN: Not at this point, no. As we get to the other recommendations, there may be additional comment.

SECRETARY KLEIN: Let's stay with this first. Mr. McKee?

MR. McKEE: Mr. Chairman, we will have copies of this document that Mr. Hall has prepared.

SECRETARY KLEIN: Yes. I think that what we are going to have to do when we wind up the open part of the hearing is you are probably going to have to wind up in Executive Session and come out with a draft that is compatible to all parties involved.

Mr. Jackson?

MR. JACKSON: Mr. Chairman, I have one or two comments, if I may.

SECRETARY KLEIN: Please.

MR. JACKSON: First, in looking over the facilities listed in Item No. 1, the Piscataway Plant of WSSC is not listed.

SECRETARY KLEIN: No. It is in No. 6.

MR. JACKSON: I didn't know whether this was a borderline case and I wasn't sure that it should or should not be in that particular listing.

SECRETARY KLEIN: No. It is in No. 6, sir.

MR. JACKSON: The second comment I have is that the insertion of ammonia nitrogen in the most recent draft in place of one which we previously had considered, which gave a table 3 listing really of the permissible or the allocations of total nitrogen, we feel that this ammonia nitrogen throws the situation into perhaps further confusion, and we would like to register the point that we would much prefer to go with the initial draft which was circulated with a listing of total nitrogen allocations, which was your former Table 3.

I think Mr. Jensen will recognize that.

SECRETARY KLEIN: I think that is more or less of a technical point and that should be ironed out in Executive Session, Mr. Jackson.

MR. JACKSON: It is, Mr. Chairman. I recognize that point. It also raises another question, though--and it is technical, I recognize--as to the requirement of substantially zero if we hold to this ammonia nitrogen.

I think Lake Tahoe is probably getting only

50 per cent in their tertiary treatment in winter, and perhaps 98 per cent in the summer, but the question of substantially zero I think again is a technical question that we could take up.

SECRETARY KLEIN: That is a question I think of cleaning up language, and again that should be referred to the Executive Session.

MR. JACKSON: Right.

SECRETARY KLEIN: But otherwise, outside of the technical aspects, are we kind of in agreement on the general principles?

That is what I am trying to get at. There will be technical items that will have to be ironed out in Executive Session.

MR. JACKSON: Mr. Chairman, this may again have to come in Executive Session, but I would like to have this group consider the addition of some language in the beginning of this item 1 that might go something like this: that based on assurances by the Federal Water Pollution Control Administration that the quality and value of the water resources of the Potomac River and tributaries in the Washington Metropolitan Area will be enhanced and pollution abated, and water quality objectives achieved by the implementing of the following measures, which I think are listed pretty much in order.

SECRETARY KLEIN: Fine. We will be glad to accept the changes in wording. Mr. Hope?

MR. HOPE: Just one further point in that regard: I would hope that the preamble that precedes the recommendations might make some reference to the established water quality criteria which are joint criteria, as you know, both of the District as well as of the FWPCA, and Department of the Interior.

> "In order to abate water pollution and to achieve compliance with the established water quality criteria for the Potomac River"--

something along that line.

SECRETARY KLEIN: I believe we can work out the wording.

MR. JACKSON: Mr. Chairman, if I may come back for just a moment?

SECRETARY KLEIN: Yes.

MR. JACKSON: On your last sentence of that No. 1, "no new discharges or increased loadings," I think we will have to clarify that language as to what new discharges we are talking about, because we may be talking about sewage treatment plant effluents, storm water overflows, or combined overflows as well. We will probably have to iron that out.

SECRETARY KLEIN: Yes, I think so, too.

Mr. Paessler?

MR. PAESSLER: I have a couple of comments, Mr. Chairman.

First of all, this stipulation of "no new discharges or increased loadings between river mile 106 and river mile 91 will be approved without the concurrence of the conferees," I would just like to point out that under the Virginia State Water Control Law we would not have the authority to per se prohibit discharges, provided those discharges will meet the stream standards as established on Virginia State waters.

Certainly, there is no disagreement with the intent of this, but when the chips are down, the law does not permit us to per se prohibit a discharge into Virginia State waters.

On the question of the Potomac which doesn't belong to Virginia itself, others have jurisdiction there and I am not going to try to go into the legalities of this.

SECRETARY KLEIN: We are still on just the first part of the first page.

MR. PAESSLER: All right, this is the first one.

The second item that I would like to comment on, and I think Item 1 should show this, is that in section 1 which we are considering here, unless conditions change and we have poor water from upstream or something else comes about to change the characteristics of the estuary, that we are locked in forever with 16,500 lbs. of BOD. While that represents an estimated 96 per cent reduction of the BOD loads at this time, it means that this percentage is going to have to be jacked up in the future, and remain 16,500 as long as we maintain the present sources of discharge. I believe that Item 1 or some part of these recommendations should point this out. I believe that this is a point that everybody should understand.

I do want to make a general comment with respect to all of these objectives. I think that the objectives are excellent and that there is no question but what this stretch of the Potomac and the entire Potomac, for that matter, needs to be cleaned up.

I do want to point out that in asking citizens of this area for the high amounts of money that are going to be required, that I think that they should understand tnat what is being suggested here is the best that we know how at the present time, and that it appears likely that there will be a substantial cleanup of the Potomac, But I want to go back to the comment that I made in the original presentation a month ago, that there may still be conditions in the Potomac after all this is done that the average citizen with his eyes and nose as an indicator may find objectionable, even though we, as professionals, can demonstrate through tests and sampling of the River that there has indeed been a substantial improvement.

I think that everybody concerned ought to be aware of this fact.

SECRETARY KLEIN: Fine. Thank you, Mr. Paessler. You and I agree on this, because what I said in the beginning is that we did the best we knew how with the technology we had at that time and we came out with a river full of gook and unusable water because we just didn't have the technology then.

We did not know about the population load.

We can foresee a population load. We have better technology now, but it still is not absolutely perfect, but we are going to do the best we possibly can.

I guess that is what all of us agree on here.

MR. PAESSLER: Yes, I think we are all in agreement on that, and I just would like to make it a part of the record so everybody understands this outside and inside this conference.

SECRETARY KLEIN: Fine. Mr. Johnson?

MR. JOHNSON: I have no more comments on this one.

SECRETARY KLEIN: Mr. Johnson, I will ask you at this time if as soon as we get this done you would call a meeting of the Commission to which you would invite all of us, please, and we will try to discuss the upstream and downstream at the same time, since you have the jurisdiction over the rest of the basin.

I would appreciate it if you would do that, if you would work out a date with all of us, so that we could get at the rest of these problems. We would be glad to cooperate with you in order to affect the whole river basin.

MR. JOHNSON: I will be very happy to.

SECRETARY KLEIN: Thank you.

MR. JACKSON: Mr. Chairman, before we leave the first page--

SECRETARY KLEIN: This is only at the top of the first page. I haven't gotten down to the construction schedule yet.

MR. JACKSON: That's right. I am at the top of the first page, too.

SECRETARY KLEIN: Fine.

MR. JACKSON: I would like to support Mr. Paessler in his concept of the relation between the 96 per cent removal in No. 1 right in the first paragraph, and the 16,500.

In our opinion, the 16,500 will require really a higher percentage removal of all of the elements than 96 per cent.

I think the group will agree with me on that. We are really speaking of more than 96 per cent when we are speaking of 16,500.

SECRETARY KLEIN: One of the things, and that is why I set this on a six-month basis, is that as we go along we are going to have to probably change here and there in order to still effectuate the same results that all of us are talking about.

On the technical aspects, all of you have a great advantage over me on that, but we are all agreed on the proposition that we will get the river cleaned up, and let's do the best we possibly can with the technology we have at our disposal today.

MR. HOPE: Just a further point on that?

SECRETARY KLEIN: Yes, Mr. Hope.

MR. HOPE: In line 3, why don't you delete the phrase "96 per cent removal"?

SECRETARY KLEIN: May we let that go to the Executive Session, please?

MR. HOPE: All right.

SECRETARY KLEIN: All right, fine.

Now, we have construction schedules in here, and if we may go down the line again with Mr. McKewen?

MR. McKEWEN: I am wondering if there isn't a mistake on recommendation 6. It is--

SECRETARY KLEIN: No, no. We are staying on construction schedules at this time on Item No. 1. Let's take them one at a time.

MR. McKEWEN: I am on 1.

SECRETARY KLEIN: Yes.

MR. McKEWEN: But you mentioned earlier Piscataway Bay was covered in Recommendation No. 6.

Actually, it is not completely, in that recommendation No. 6 deals only with the advanced waste treatment plant which would not treat the entire effluent from the Piscataway Plant, at least as it is presently proposed.

SECRETARY KLEIN: If you would like to expand that at that time when we get to recommendation No. 6, I will be glad to take it up with you.

MR. McKEWEN: What I am saying is we may have to add Piscataway to page 1.

SECRETARY KLEIN: Let's take it up when we get to No. 6 and then see what we have to do with it, and if we have to add it to page 1, we may.

MR. McKEWEN: All right, we will do that.

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: I have no comment, Mr. Chairman.

SECRETARY KLEIN: Mr. Jackson?

MR. JACKSON: Mr. Chairman, some of us always find ourselves constrained to reality, and this is my comment at this point.

I am referring now to the third line in which, on the last column, there is an operational date of January 1, 1975.

Mr. Chairman, we have had our consulting engineers in this past week. We also met with representatives of FWPCA, and they were Mr. Frederick Bishop, Gary Gardner and Warren Carter. Our engineers, my staff, and this group from FWPCA discussed the realities of construction dates.

In our opinion, and we felt that this was the consensus of this group, we could not possibly complete the 90 per cent removal and move into the nutrient removal process any earlier than January 1, 1977. I would like to submit that as a substitute for that date of January 1, 1975.

Moving down to the next item, Interim Schedule 4, 90 per cent removal, we would like to have that clarified as to what. We assume it is organic removal, but I think that should be clarified.

But again, on the same basis as we have discussed before, we feel that that operational date, July 1, 1972, will have to be July 1, 1974 to meet the realities of the situation.

I think you can appreciate and this group can appreciate that to build in the neighborhood of the half-million dollars that you mentioned before, we have just got to have time to do it, and these are the realities as we see them.

That is my comment on the first part, Mr. Chairman.

SECRETARY KLEIN: If I may say to you, I would rather leave them in there and see how we progress and see what has to be done after we get some of this implementation under way.

I just make that suggestion to you and leave your comments on the record.

Yes, Mr. Hope?

MR. HOPE: No comment.

SECRETARY KLEIN: Mr. Paessler?

MR.PAESSLER: I have no comment.

SECRETARY KLEIN: Mr. Johnson?

MR. JOHNSON: Yes. I would like to raise a question about the plants other than the D.C. plant.

Let me take Alexandria as an example. I think this probably applies to most of the other plants in the Metropolitan Area.

It is my understanding, at least, that Alexandria is headed right now in the way of a 90 per cent BOD removal program, and I would hate to see this delayed in order to have to go back and redesign for the nutrient removal.

I would suggest that possibly there need to be some adjustments in this to recognize this, that we don't upset their present schedules of removal of BOD in order to bring the nutrients into the picture immediately.

SECRETARY KLEIN: I believe your point is well taken, that we should move ahead as far as we can and then go from there, and I guess that is about what you said.

MR. JOHNSON: Yes.

SECRETARY KLEIN: It is an individual problem and will have to be looked at as an individual problem.

MR. PAESSLER: Mr. Chairman?

SECRETARY KLEIN: Yes, Mr. Paessler.

MR. PAESSLER: I do have one comment.

With reference to several of these Virginia discharges there, in addition to the effectuation of additional treatment there are dispersion problems perhaps for the prevention of local nuisances. These may come in to complicate the situation in these schedules.

If these can be adjusted as we go along, as the emergencies and the contingencies arise, I won't raise any further question at this time.

SECRETARY KLEIN: I will say to you that keeping this on a six-month schedule, Mr. Paessler, we are undoubtedly going to run into problems here and there and everywhere, and we are just going to have to take them up and solve them one at a time. I think I made that clear.

When I was up before the Senate for confirmation and they asked me questions, I said, "I know of only one way to do these things, and that is just meeting one problem at a time," and you as engineers know it, too. It is just one problem at a time.

Sometimes it breaks down into minute quantities, but we still have to meet them one problem at a time, and if we have to change to meet a problem, we will change to meet that problem.

MR. PAESSLER: If we consider these as target dates and not as absolute fixed schedules, then I think we agree on it.

SECRETARY KLEIN: Yes. I think that that is here now because nobody has started on the engineering for this now, and when we start engineering and start the financing looksee, we may have to change here and we may have to change there, but we are all agreed that we are going to get there. We may lose a little battle here or a little battle there, but let's win the war.

MR. JACKSON: Mr. Chairman, if I may, we have started engineering on this 90 per cent removal, and this is one of the bases for my commenting on the moving up of this date.

I would like for the record to show that.

SECRETARY KLEIN: Fine.

MR. JACKSON: Thank you.

SECRETARY KLEIN: Now, the schedules are on the bottom of page 1 and top of page 2, and now we are talking about the rest of page 2.

Are there any further comments from the conferees on these schedules?

Mr. Johnson.

MR. JOHNSON: I raise a question about the projected plant in Prince William County. This is not listed in the schedule, and I wonder if it should not be.

SECRETARY KLEIN: It is a question as to whether that was within the scope of the conference. It is right on the edge.

MR. JOHNSON: It is right across the river from the Mattawoman Creek, which is in the area. Prince William County, I believe, is in the Council of Metropolitan Governments.

SECRETARY KLEIN: Mr. Paessler, would you have any comment on that?

MR. PAESSLER: Well, I think on the question of whether you want to include it in or not, in my opinion it is right on the ragged edge of whether it is in this conference area, and I don't think it is going to make a lot of difference in the real crux of the situation, which is the immediate section one of the Washington Metropolitan Area.

I would say that it might be a good idea to leave this on a back burner to be considered as we move along and see what develops.

SECRETARY KLEIN: Fine, Mr. Paessler. We will bow to your judgment on this point.

MR. PAESSLER: Thank you.

SECRETARY KLEIN: Anything further from the Conferees? Mr. Jackson.

MR. JACKSON: Mr. Chairman, I would raise a question on the middleof the paragraph on that page, which refers to "the below-listed treatment plants are to provide 96 per cent BOD removal and 96 per cent phosphorus removal," but there is no mention of nitrogen in this case.

For this to be consistent, I would assume that nitrogen would apply here as well.

SECRETARY KLEIN: Mr. Jensen.

MR. JENSEN: I think that is an oversight on our part and that should be in there. This would be consistent then with Mr. Coulter's recommendations also.

SECRETARY KLEIN: Gentlemen, in view of our general understanding on these matters, and leaving cleaning up the report as to technical language and items, we will reserve those for the Executive Session, and let's go on to Number 2.

Recommendation No. 2 has to do with effluent disinfection.

Mr. McKewen?

MR. McKEWEN: I have no comment. I do have a question for clarification.

Does this indicate that the fecal coliform MPN in the effluent shall meet the standards established for the receiving stream itself?

MR. JENSEN: Substantially, yes.

SECRETARY KLEIN: The answer was "Substantially, yes." Is that what you said, Mr. Jensen?

MR. JENSEN: That's correct.

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: No comment, Mr. Chairman.

SECRETARY KLEIN: Mr. Jackson?

MR. JACKSON: Mr. Chairman, the word "immediately" bothers us. We are not opposed at all to immediate chlorination of the effluent, but we must get a better secondary effluent in order to actually make the reduction you require in the latter part of that sentence, so I wanted the record to show that we cannot comply with that in the effective sense that is mentioned here, but we will--

SECRETARY KLEIN: We will change the word "immediately" in Executive Session.

MR. JACKSON: Or if you put a period after "immediately", we can fairly well live with it.

SECRETARY KLEIN: Yes.

MR. JACKSON: That is, we would certainly do that.

I have just a mild complaint in the shift from water quality standards in the river itself to effluent standards, which is implied here.

I believe that is really beyond our consideration here. We have been dealing with water quality standards in the river and we have gone into effluent standards by implication.

SECRETARY KLEIN: I think we could delete those three words, "in the effluent," and still stand on it.

MR. HOPE: Right.

SECRETARY KLEIN: Fine. Mr. Hope?

MR. HOPE: No; that satisfies my point.

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: The previous discussions have satisfied my point. We are talking about the stream and not the effluent, I think.

SECRETARY KLEIN: This is one of the great difficulties we have, because we know if we can control effluent, we can control the stream, and when we go to the stream, sometimes we can't always measure it.

Mr. Johnson?

MR. JOHNSON: No comment.

SECRETARY KLEIN: Gentlemen, may we proceed to No. 3?

Here, I believe, Mr. McKewen, this is mainly yours.

MR. McKEWEN: Mr. McKee will take it.

SECRETARY KLEIN: Mr.McKee.

MR. McKEE: Mr. Chairman, my only question is regarding the compliance with orders, is this to meet the water quality standards in the receiving stream?

SECRETARY KLEIN: Mr. Jensen.

MR. JENSEN: It was our understanding that that was the intent of your orders.

MR. McKEE: Yes, that's fine.

MR. JENSEN: And we probably could modify this accordingly.

SECRETARY KLEIN: Will you change the wording, please, then, to comply with the request of the State of Maryland? Mr. Jackson?

MR. JACKSON: Mr. Chairman, I have no comment on No. 3.

SECRETARY KLEIN: Mr. Hope?

MR. HOPE: A little phraseology in the concluding paragraph on that page, but I think we can solve that better in Executive Session.

SECRETARY KLEIN: Fine. Mr. Paessler?

MR. PAESSLER: No comment.

SECRETARY KLEIN: No comment. Mr. Johnson?

MR. JOHNSON: No comment.

SECRETARY KLEIN: All right, may we proceed to No. 4, gentlemen?

This probably will have to be done, if we possibly can do it, with research funds from FWPCA to coordinate the work from everybody concerned in here.

Mr. Stein, will you take this matter up with Research and Development, and Mr. Jensen also, to make sure that funds become available?

I think we might be able to go into further pilot plant work in order to find the best feasible way of doing what we all are agreed should be done in the area.

Now, may I go ahead?

Mr. McKewen?

MR. McKEWEN: The only comment I have is that if the January 1st deadline is to be realistic, it is going to require immediate action to arrange funding and organization of the setup.

SECRETARY KLEIN: I understand this.

If we run into difficulty, we are meeting again in November of 1969, and we will meet again in the spring of next year, and at that time we can evaluate how far along we are going and how it is coming along and what we will be able to do with it.

On this, by the way, Mr. Johnson, since it is this area, and it ties in with all the rest, if you would cooperate with Mr. Stein and Mr. Jensen, so we can evaluate again the whole basin, so that we get the problem all at once and get it all solved?

MR. JOHNSON: Fine.

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: No comment.

SECRETARY KLEIN: Mr. Jackson?

MR. JACKSON: Mr. Chairman, are we still dealing with No. 4?

SECRETARY KLEIN: Yes.

MR. JACKSON: I find no other place that I might make this comment--

SECRETARY KLEIN: Fine.

MR. JACKSON: --but the words "space limitations" bring to mind that we must have some help from FWPCA on the question of space.

SECRETARY KLEIN: Go ahead and make that comment fully, will you please, for the record at this time?

MR. JACKSON: I was, Mr. Chairman.

SECRETARY KLEIN: Fine.

MR. JACKSON: As you know, we have a space problem at the District of Columbia plant. We need an additional 50 acres to carry out the objectives of what we are discussing this morning. We will need FWPCA's help in this, because if we are to obtain these objectives on one hand and build the plant, we have got to have the land on which to build it.

FWPCA, I think, can help us a great deal in this, and I think this same comment could apply very much to the Piscataway situation of WSSC.

Thank you.

SECRETARY KLEIN: You haven't caught all of it yet.

MR. JACKSON: I'm open to suggestion (laughter).

SECRETARY KLEIN: You want to fill in part of the river.

MR. JACKSON: That is just what I mentioned, the 51 acres.

SECRETARY KLEIN: You didn't say how.

MR. JACKSON: I want to dredge it out in accordance with the Corps of Engineers requirements to maintain hydraulic capacity in that stream and to, at the same time, deposit that behind bulkheads in which to create an area of 51 acres to build an advanced waste treatment plant.

SECRETARY KLEIN: What is the depth of the river in front of this area or in the area you want to dredge? Is it deep or what?

MR. JACKSON: It is fairly shallow at the present time. I can't give you the soundings on it.

I can say again for the record before the end of the day roughly what the depth of that water is, but I believe it is fairly shallow.

SECRETARY KLEIN: Would you please furnish all of your figures and a description of it for the record?

If you can make a drawing and have complete data for the record, I would appreciate it.

MR. JACKSON: Does this have to do with the Department of Water, Mr. Chairman?

SECRETARY KLEIN: The Department of Water and where you are going to put it and how you are going to do this.

MR. JACKSON: We have it on the record, but we can certainly give you additional.

SECRETARY KLEIN: Would you, please?

MR. JOHNSON: Mr. Chairman, I would like to make a statement in this respect.

SECRETARY KLEIN: All right, fine.

MR. JOHNSON: I think we recognize that in this area there is considerable opposition raised from time to time with regard to filling large areas.

I have made it a point in the last month or two to contact a number of such interests, and I think I can report today for the record that there would be no outcry in regard to filling in this particular point because these interests recognize that if you are going to clean up the pollution coming into the Potomac you have to have a place to do it, and this appears to be the only logical point to do this.

So, I think I can safely say that the interests who would ordinarily object to filling would not object in this instance, because they recognize the need.

SECRETARY KLEIN: Fine. Mr. Hope?

MR. HOPE: My only suggestion would be that in these engineering analyses that are made, we include some reference to the cost benefit relationships which will exist.

Here again, we need the basic information on which we can explain to the people to whom we are responsible the benefits which will accrue and, hopefully, in a dollarwise manner.

SECRETARY KLEIN: In this case, I don't know whether cost benefits would apply, because we have got a health proposition here which I think overrides cost benefits.

MR. HOPE: You are hearing from the health representative of the District of Columbia at the moment?

SECRETARY KLEIN: Yes, I know.

MR. HOPE: And this is one reason why we would like to have that kind of data.

SECRETARY KLEIN: Fine.

MR. JENSEN: Mr. Hope, are you referring to the relative costs of different methods of waste disposal in the area--something equivalent, say, to the San Francisco Bay engineering study that has recently been released, which would go into the various costs of alternate methods of waste disposal for the entire metropolitan area?

MR. HOPE: That's right.

MR. JENSEN: I think I understand it then.

SECRETARY KLEIN: Would you clean this up then in Executive Session, please?

Mr. Paessler?

MR. PAESSLER: Mr. Chairman, I am glad that you have just directed that you are indeed looking into the implementation of this, because getting the funds from the State agencies and from the municipalities and so forth to do some of these is going to be difficult, and with FWPCA taking some of the initiative in some of the funding of this, I think it is something that we can do.

SECRETARY KLEIN: Well, it must be done, and I think actually, if we do this, not only as a Potomac but as a pilot plant type of study so that we know what to do in other estuaries and in other rivers in other large cities, it would help a great deal, and on this basis we will do the best we possibly can, Mr. Paessler.

MR. JENSEN: Mr. Chairman, we have already had some discussions with some of the agencies in the Metropolitan Area of the possibility of helping out on this through our 3(c) grant mechanism as well, so we perhaps have another avenue we can follow

SECRETARY KLEIN: Mr. Jackson?

MR. JACKSON: Mr. Chairman, may I raise one other question there as to the relationship between this Item No. 4 and our discussion, at least, or proposal as to estuarial research, which I will not describe here now but which has been discussed before.

Could we clarify this when we consider this Item No. 4 in Executive Session?

SECRETARY KLEIN: Yes. On estuaries, the Division of Fish and Wildlife and Parks has a study going, and so has my division, and between the two of them we are going to try to tie in general estuarian problems and see whether we can come out with something on this, and I understand the Under Secretary may put on a special consultant because of the major problems that are coming up in all the estuaries of the country.

Number 5, gentlemen. The first sentence

is yours, Mr. Jackson, and Mr. Hope's in that order.

MR. JACKSON: Mr. Chairman, project C cannot in itself eliminate sewer overflows. I would like to have that read as follows:

"The District of Columbia complete their Project C by 1971," instead of 1970.

My comment here, Mr. Chairman, is that we, I believe, in this particular program have done all within our power to complete this in proper time, but there may be elements which are beyond our control, and 1971 is our best estimate.

SECRETARY KLEIN: Mr. Jensen?

MR. JENSEN: Mr. Jackson's comments are consistent with the material which was presented at the earlier session of the Conference, and he has correctly stated it.

SECRETARY KLEIN: Mr. Hope?

MR. HOPE: No comment.

SECRETARY KLEIN: On Maryland, Mr. McKewen and Mr. McKee?

MR. McKEWEN: Yes. Mr. Chairman, we feel that this recommendation needs to be stronger because we can't really enhance and then protect the quality of the estuary unless we do a far better job, and more quickly, on eliminating both combined sewers and also eliminating any discharges from sanitary sewers.

We do have some suggested changes to the language which would lengthen the recommendation considerably, and if you would care to leave it for the Executive Session, fine, but basically we are suggesting that we assign a fairly short time horizon to the elimination of all overflows, such as 1974, rather than language such as reflects an accelerated program.

SECRETARY KLEIN: Since that is a new item, I will leave it to the Executive Session.

MR. JACKSON: Mr. Chairman, may I comment on this?

SECRETARY KLEIN: Yes.

MR. JACKSON: Again, I have to return to the word "realistic".

I am sure Mr. McKewen just can't mean what he says.

SECRETARY KLEIN: I'm sure he did.

MR. JACKSON: We will cover this in Executive Session, but again may I perform the role of keeping our concept a little bit on the realistic side?

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: Mr. Chairman, I will reserve my comment for the Executive Session.

I have a question about the elimination of pollution in Rock Creek and Anacostia, where the rest of the statement reflects the elimination of combined sewer overflows, and I am not sure what the intent is here.

SECRETARY KLEIN: All right, fine.

Mr. Paessler?

MR. PAESSLER: The information which I have indicates that this requirement for Alexandria to eliminate pollution from combined sewer overflows by 1972 is probably unrealistic. To have this eliminated by 1972 is unrealistic, and I would like to discuss this further in the Executive Session.

SECRETARY KLEIN: Mr. Johnson?

MR. JOHNSON: No comment.

SECRETARY KLEIN: We will now go to Piscataway Bay, No. 6, and at this point probably we are going to have to ask that exact types of removal, BOD load, and dates be discussed, and since it is not in here, it may be better that that part of it again go to Executive Session unless some of you have some ideas on this, and especially Mr. McKewen and Mr. McKee.

MR. McKEWEN: I simply would call attention to the fact, and probably your staff has more current information on this than I do, that the advanced waste treatment plant at Piscataway was not to treat the entire plant discharge, and therefore this recommendation by itself would not adequately cover the plant.

SECRETARY KLEIN: You want it to cover the entire discharge and have the same type of treatment for the same standards?

MR. McKEWEN: To be consistent, I feel we must do this.

SECRETARY KLEIN: What date do you think should cover?

MR. McKEWEN: That I am really not prepared to say.

SECRETARY KLEIN: I see.

MR. McKEWEN: I don't know if we have a representative here from Washington Surburban who may have information on this or not. I do not.

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: No comment, Mr. Chairman.

SECRETARY KLEIN: Mr. Jackson?

MR. JACKSON: Mr. Chairman, no comment, but I certainly would like to have my schedule which we have discussed changed to this wording, if possible.

SECRETARY KLEIN: No. I think we are going to change this wording over to your schedule.

Mr. Hope?

MR. HOPE: No comment.

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: No comment.

SECRETARY KLEIN: Mr. Johnson?

MR. JOHNSON: I have no comment, except that I think I would agree with what Mr. McKewen was saying.

SECRETARY KLEIN: All right. Mr. McKewen, would you call on a representative of Washington Suburban Sanitary District, if they are here?

MR. McKEWEN: If there is one present.

SECRETARY KLEIN: Yes.

(No response)

SECRETARY KLEIN: I will hold the record open, and I wish you would implement it for the remarks that either you secure or Mr. Jensen secures or both secure jointly from Washington Suburban.

MR. McKEWEN: We will do this as rapidly

as possible.

SECRETARY KLEIN: Mr. Jensen, I might ask you: Was Washington Suburban notified of this meeting?

MR. JENSEN: Yes, sir. All the persons who attended the conference were invited to attend this session.

SECRETARY KLEIN: Fine.

MR. STEIN: Would it be possible to get in touch with those people by the time of the Executive Session so that we might wrap this up this afternoon?

MR. McKEWEN: Quite possibly.

SECRETARY KLEIN: If you would implement that, Mr. McKewen, so that a member would be here this afternoon for the Executive Session?

MR. McKEWEN: Surely.

SECRETARY KLEIN: Thank you.

You almost got out of that, Norm (laughter).

Let's move on to No. 7.

Gentlemen, I don't know whether you can possibly implement this with specific language. I would like it if the conferees could implement this septic tank and raw discharges with specific language.

You and I know that we have real problems with septic tanks, not only with polluting streams but with actual pollution of the land because of overuse of them, and raw discharges should not be tolerated under any circumstances.

It is a question of whether you gentlemen can implement this in Executive Session. I would appreciate it if you would do so.

Are there any other comments? Mr. McKewen?

MR. McKEWEN: Just as a matter of record, that we agree with the intent of this statement and recommendation, and we are, as part of the total program for this area, developing both new State and new county regulations for septic tank control.

SECRETARY KLEIN: Thank you. Mr. McKee?

MR. McKEE: No comment, Mr. Chairman.

SECRETARY KLEIN: Mr. Jackson, I don't think you have any problem on this?

MR. JACKSON: No. That's the only one.

SECRETARY KLEIN: The same for Mr. Hope?

MR. HOPE: That's right.

MR. STEIN: May I go off the record?

(Discussion off the record)

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: No comment.

SECRETARY KLEIN: Mr. Johnson?

MR.JOHNSON: No comment.

SECRETARY KLEIN: Fine.

On No. 8, gentlemen, we, of course, had quite a discussion here last time on the effects and control of soil erosion.

I have run into this in a great many other places. As a matter of fact, a good deal of the dredging that has to be done on the Cuyahoga and Maumee Rivers and that had in the past been dumped into Lake Erie came from soil erosion practices.

Mr. McKewen?

MR. McKEWEN: No comment.

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: Mr. Chairman, the responsibility in Maryland for soil erosion control is in the Department of Water Resources, and the Department has on draft at the present time a program for erosion control in the State.

Now, this is erosion control from urban development, not from agricultural practices, but this will be completed and given to the Governor and the Maryland Legislature within a month.

SECRETARY KLEIN: Thank you. Mr. Jackson?

MR. JACKSON: Mr. Chairman, I'm a little confused. I assume we are talking about item No. 9?

SECRETARY KLEIN: No. 8, soil erosion.

MR. JACKSON: I'm sorry.

SECRETARY KLEIN: I don't know whether you have much in that way in the District.

MR. JACKSON: We do. We do have, but not much, but there is a problem. But no comment.

SECRETARY KLEIN: Mr. Hope?

MR. JACKSON: Mr. Chairman, as a matter of fact, I think we have already passed legislation to that effect in the District. I'm sorry; I didn't recognize that.

I have copies of the soil erosion prevention and so forth published in the District of Columbia Register.

SECRETARY KLEIN: Fine.

MR. JACKSON: It has already been enacted.

SECRETARY KLEIN: Mr. Hope?

MR. HOPE: I pass.

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: I pass.

SECRETARY KLEIN: Mr. Johnson?

MR. JOHNSON: Mr. Chairman, since the discussion in April, I have brought together a small group of people representing particularly the soil conservation service and representatives of the soil conservation district in the area, and this ad hoc committee has come up with some suggestions for sediment control in the conference area.

Now, I have copies here that I can supply, and, as far as I am concerned, they should merely be inserted in the record, or I will read them, either way.

SECRETARY KLEIN: Let's not read them. We will insert them in the record.

The gist of them, Mr. Johnson, if I may ask?

MR. JOHNSON: Well, the gist is that there are citizens and public agencies in the area who have authority and responsibilities for this problem, and this recommends that certain actions be taken by these various agencies.

SECRETARY KLEIN: Fine. Mr. Johnson, have you done anything at all on soil erosion outside of the conference area?

MR. JOHNSON: Not in this paper, no.

SECRETARY KLEIN: But you have done something on it?

MR. JOHNSON: There are ongoing programs, of course, in the rural areas.

SECRETARY KLEIN: Fine.

(The following document was submitted by Mr. Johnson for inclusion in the record:)

RECOMMENDATIONS OF AD HOC COMMITTEE FOR EROSION AND SEDIMENT CONTROL IN CONFERENCE AREA

Sediment is recognized as one of the major pollutants of the Potomac River. While production of sediment occurs over the entire basin, much of this production finds its way to the estuary where it is deposited. The Washington Metropolitan region, while accounting for only about 10 per cent of the land area in the basin, is responsible for about two-thirds of the sediment that reaches the estuary.

In order to accelerate programs to reduce sediment production in the Metro region, the following recommendations are made:

1. (a) FWPCA should establish a sediment pollution control office with a staff head and an ongoing program to coordinate the authority and activities of the

agency with action programs in erosion and sediment control.

(b) FWPCA should accelerate R & D grant activities in the field of erosion and sediment control by relaxing standards of qualification or through other appropriate and available means.

2. That the Interstate Commission on the Potomac River Basin be requested to head an ad hoc task force to speed implementation.

3. That the Interstate Commission on the Potomac River Basin and other appropriate agencies develop a sediment control plan.

4. That:

(a) State water control agencies clarify and use their authority.

(b) Counties and other local jurisdictions clarify and use their authority.

(c) The current action program of S.C.S. for the control of sediment and erosion should be accelerated within the Conference area with particular emphasis on adequate funds for staffing purposes.

(d) Soil Conservation Districts develop a basin-oriented program.

(e) Provisions of Executive Order 11288, July 2, 1966, be expanded to specifically include erosion and sediment control.

5. Since erosion and sediment production occurs over the entire basin, the Conference should be expanded to include the entire basin.

* * *

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: Before we pass this over, this was brought out in the first session of the Conference a month ago, but I think we are all cognizant of the fact that Fairfax County has been a leader in the adoption of local ordinances and local legislation on this subject of soil and erosion control with special reference to construction and other sources of this type.

SECRETARY KLEIN: Gentlemen, may we proceed to No. 9.

Well, that came home. I don't think there are any comments from anybody but me, and I will immediately initiate procedures to have such a message given.

MR. JACKSON: Mr. Chairman, may I just comment on Item No. 9?

This specifies a log boom. There may be a better way of doing it. I don't know.

SECRETARY KLEIN: "Install and maintain a device," and take out "log boom".

MR. JACKSON: They would use their expertise, it would seem to me.

SECRETARY KLEIN: Yes.

MR. McKEE: Mr. Chairman, are we going to ignore sediment from upstream?

SECRETARY KLEIN: No. As a matter of fact, I think you missed the question I directed to Mr. Johnson when he passed out these items of his.

I asked whether he was doing anything on this erosion upstream, and, as a matter of fact, I would suspect that this would be covered at the conference that I have asked Mr. Johnson to call and invite us all to be there.

No. 10, gentlemen.

MR. JOHNSON: Mr. Chairman, on No. 9 for a moment?

SECRETARY KLEIN: Yes, Mr. Johnson.

MR. JOHNSON: The Corps of Engineers, I believe, does operate a trash sweeper in the estuary.

There is some question in my mind, although I recognize that I am not too familiar with it, whether or not the effort that is being made at the present time is adequate, and there is no reference to it in this comment.

I think maybe this should be expanded a little bit to bring this in.

SECRETARY KLEIN: I would ask the Conferees in Executive Session to put this in the kind of shape that they think it should be in to properly handle this from one Governmental agency to another so that it is properly phrased and can be accepted by the Secretary of the Interior and the Secretary of Defense.

No. 10, gentlemen. I think that this might fall in as an augmentation of No. 4, which is the engineering analysis.

They certainly would have to make a joint survey of oil storage and so forth, but it might be well to emphasize it.

Mr. McKewen?

MR. McKEWEN: No comment.

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: No comment, Mr. Chairman.

SECRETARY KLEIN: Mr. Jackson?

MR. JACKSON: No comment, Mr. Chairman.

SECRETARY KLEIN: Mr. Hope?

MR. HOPE: I would leave it as a separate recommendation, if you were asking the question, Mr. Chairman.

SECRETARY KLEIN: I thought it should be a separate recommendation, but augmenting No. 4.

MR. HOPE: Right.

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: No comment.

SECRETARY KLEIN: Mr. Johnson?

MR. JOHNSON: No comment.

SECRETARY KLEIN: We will move on to Recommendation No. 11.

Is there a representative of the National Park Service present?

(No response)

SECRETARY KLEIN: Mr. Jensen, have they been consulted?

MR. JENSEN: Mr. Chairman, I have consulted with my counterpart, Mr. Dickinson, the Deputy Regional Director for the National Park Service in this area.

He has reviewed this and indicated that

in his opinion it would be an acceptable recommendation to them.

SECRETARY KLEIN: Mr. McKewen?

MR. McKEWEN: No comment.

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: No comment.

SECRETARY KLEIN: Mr. Jackson?

MR. JACKSON: No comment, Mr. Chairman.

SECRETARY KLEIN: Mr. Hope?

MR. HOPE: No comment.

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: No comment.

SECRETARY KLEIN: And Mr. Johnson?

MR. JOHNSON: No comment.

SECRETARY KLEIN: No. 12, again, gentlemen, should be as Mr. Hope stated before, kept separate but probably also augment No. 4, since its analysis then would be a continuing analysis or part of a continuing analysis by having a surveillance program. Mr. McKewen?

MR. McKEWEN: No comment.

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: Mr. Chairman, I would suggest that included in this be a surveillance program conducted by the State and the District, so that it would not only be the Federal surveillance program but the coordination and organization of all the surveillance programs in the area.

MR. JENSEN: Mr. Chairman, it was our intention that FWPCA perform only the coordinating role in here with some supplemental sampling.

We recognize the programs that are now under way, and we would not propose to duplicate them.

SECRETARY KLEIN: I think it would be well to add in after "FWPCA", "the States of Virginia, Maryland and the District of Columbia", so that we all coordinate together. I think that would be a better way of phrasing it, and I think that it would be well to do so.

That meet your approval, Mr. McKee?

MR. McKEE: Yes, sir.

SECRETARY KLEIN: Mr. Jackson?

MR. JACKSON: I think that meets my comment, Mr. Chairman.

SECRETARY KLEIN: Mr. Hope?

MR. HOPE: No comment.

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: I think this is fine.

SECRETARY KLEIN: Mr. Johnson? We had better get the Commission in there.

MR. JOHNSON: I assumed your intent was to put the Commission in there.

SECRETARY KLEIN: Yes. I'm sorry. As soon as I got to you, I realized that.

All right, we will add the Commission in there, so that we all worked together, and that is what it is going to take in order to get the job done.

No. 13, gentlemen, speaks for itself because there is now a bill before Congress which puts total control of sewage disposal from vessels in the hands of the Federal Government because of the difficulty of running from one State to another on water, and, second, because of the problem of interstate commerce, and a State's law might affect interstate commerce.

However, the regulation still has to be drafted, and we expect that the wishes of the States will be brought into play before the regulations are drafted.

Any comment, Mr. McKewen?

MR. McKEWEN: Simply to state that we do have a draft of State regulations now on watercraft. We are very much hoping that we will not have to adopt those until there is Federal legislation which we can use as a guideline because of the interstate problem you mentioned.

SECRETARY KLEIN: I think if the Federal bill becomes law, you cannot pass a law on vessels. It will totally pre-empt it.

MR. McKEWEN: Including the small watercraft?

SECRETARY KLEIN: Yes, and the instructions are to FWPCA to draft the regulation. I don't want to have them draft it without consultation with the States, as you might well understand.

MR. McKEWEN: Who will do the enforcement?

SECRETARY KLEIN: I think the States or the Coast Guard or whoever will have to do it.

MR. HOPE: The Coast Guard.

SECRETARY KLEIN: The Coast Guard I think, in this case. Mr. McKee?

MR. McKEE: Mr. Chairman, my only suggestion was that if the Federal law does not pass, that we should possibly state here that the FWPCA will coordinate the development of uniform State regulations.

SECRETARY KLEIN: That might be well. I

think the conferees might take this up in Executive Session and add this to it, that the FWPCA will coordinate with the States effective uniform legislation, something of that sort, and let the exact wording come out of the Executive Session.

Mr. Hope?

MR. HOPE: We have regulations pending before the District Council regarding the discharge of wastes from watercraft. They are withholding action waiting for some action at the Federal level.

SECRETARY KLEIN: I am sure you will get it.

MR. HOPE: If we don't get it, we are prepared to move.

SECRETARY KLEIN: Fine.

Mr. Jackson, anything further?

MR. JACKSON: No further comments, Mr. Chairman.

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: Virginia does have permissive legislation on the books covering the adoption of rules and regulations on vessel pollution.

We also are withholding action pending the clarification of the Federal situation.

SECRETARY KLEIN: Fine. Mr. Johnson?

MR. JOHNSON: No comment.

SECRETARY KLEIN: We may proceed to No. 14.

I think this one should be augmented by the request that I made of Mr. Johnson for his calling a meeting of his Commission and inviting us all there to be part of that Commission hearing in order to determine the rest of the basin problems, in order that our work here be not in vain.

Mr. McKewen?

MR. McKEWEN: I simply want to indicate not only support of the recommendation as it stands, but also to state that we are concerned about up basin pollution control, not only to protect the estuary, but also to protect the upper portion of the basin itself, because it has been said the two are inseparable.

SECRETARY KLEIN: Your comment is well made, and I think it should be redrafted to cover both these items. Mr. McKee?

MR. McKEE: Mr. Chairman, I would suggest again that we need some leadership or a coordinator in this joint effort also. It might be the Interstate

Commission; it might be FWPCA.

SECRETARY KLEIN: I think the Interstate Commission is the one here. Mr. Jackson?

MR. JACKSON: Mr. Chairman, would the meeting which you have suggested that Mr. Johnson call appropriately consider whether consideration should be given to an enforcement conference on the upper basin?

SECRETARY KLEIN: Well, I think they could take that up very well. Mr. Hope?

MR. HOPE: This recommendation seems a little bit vague to me. Wouldn't it be possible again to make reference to the established water quality standards of the State of Maryland so that the water, as it enters the District boundaries, does in fact meet those standards?

SECRETARY KLEIN: I think that is well taken.

MR. McKEWEN: This will be a reasonable inclusion.

SECRETARY KLEIN: Fine. The Executive Committee will go into that. Mr. Johnson?

MR. JOHNSON: No comment.

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: No comment, Mr. Chairman.

SECRETARY KLEIN: I might say to you that from what little I know of it, I think we had better start worrying about water supply upstream also because, as I understand it, we have been running pretty close to depletion of the river in many cases, and we may need some reservoirs up there to augment your late summer and early fall supply.

Mr. Jackson?

MR. JACKSON: Mr. Chairman, if I may, I would certainly like to take this opportunity to support you on that. As a matter of fact, some of the suggestions that we have made here would raise the question of low flow augmentation for water supply and also to solve some of the problems we have here, so that upstream dams could very well supply the answers to some of the problems here.

It is true that we are below at this time of the year the flow of the river. This includes 1966 when we had a low flow, so that we have ahead of us, I think, a very dry summer.

SECRETARY KLEIN: This may augment the possibility of our getting something done when the water supply drops way down.

MR. JACKSON: Yes, sir, a drought or catastrophes always help (laughter).

SECRETARY KLEIN: I am not looking for catastrophes, but just saying that when a problem is brought home to people and they realize that there is a problem, that is the time you get the help.

MR. JACKSON: That's right.

SECRETARY KLEIN: Without looking for it, I just say that it may be there.

MR. JACKSON: Well, I think that is correct, Mr. Chairman. It is something of a catastrophe, though, when you have actually used out of the river greater than the river has produced, although on different days.

SECRETARY KLEIN: That's about right.

MR. JACKSON: That is pretty close to catastrophe.

SECRETARY KLEIN: Yes.

Mr. Johnson?

MR. JOHNSON: I would just like to relieve Norm's apprehension as to the summer. We are having a public boat trip Saturday. I am sure it is going to rain (laughter).

SECRETARY KLEIN: Wash your car as well.

Mr. Paessler?

MR. PAESSLER: No comment.

SECRETARY KLEIN: Well, they have public progress meetings on the first Tuesday of April and October and instead of that I have already set a date, so you will change that to the dates that I have set, if you will, please, and that will be November and May instead, because we have got to have six months from now approximately instead of six months from the hearing date. We are first going ahead from now. We have not been able to do anything yet, and you would be throwing away the first month if you went in in October.

If you gentlemen would change No. 15 to what I have said in my preliminary statement, I would appreciate it, unless there is objection to the date of November 6, 1969 and interim reports of October 9, 1969.

Mr. McKewen?

MR. McKEWEN: I think it is a good idea.

SECRETARY KLEIN: Mr. McKee?

MR. McKEE: I would support it, Mr. Chairman.

SECRETARY KLEIN: Mr. Jackson?

MR. JACKSON: I support the idea, Mr. Chairman

SECRETARY KLEIN: Mr. Hope?

MR. HOPE: Yes.

SECRETARY KLEIN: Mr. Paessler?

MR. PAESSLER: No objection.

SECRETARY KLEIN: Mr. Johnson?

MR. JOHNSON: No comment.

SECRETARY KLEIN: Well, gentlemen, if there is nothing further here we will recess into Executive Session. At that point, I will leave it to Mr. Murray Stein to Chair the Executive Session, and I have to return to Interior.

The next public session will be on the date set, and that is November 6, 1969 at 9:30 a.m.

Mr. Stein, at the time that the Executive Session ends, will you let the press know and whoever else wants to know and hold a conference at that time to let them know exactly what was done with these recommendations?

MR. STEIN: Right.

SECRETARY KLEIN: In general, however, as the public and the press are here today, the conferees generally agreed on the report and recommendations in cleaning up of the language that is involved in the potential schedules.

Yes, sir?

MR. DIXON: Might I ask a question, please?

SECRETARY KLEIN: Yes, sir.

MR. DIXON: I have been informed, and perhaps incorrectly, that the Corps of Engineers and the Navy are excluded from these regulations. Is that so?

SECRETARY KLEIN: They as a separate entity of the Federal Government are not subject to the Federal Water Pollution Control Act. However, the President, by Executive Order, has asked and directed that they accede to the same regulations that have been put in by this Conference.

MR. DIXON: Very well. Thank you.

SECRETARY KLEIN: Gentlemen, the public meeting is adjourned.

(Whereupon, at 11:10 a.m., the conferees went into Executive Session, and the following recommendations were arrived at by the conferees:)

RECOMMENDATIONS

The Conferees, depending upon the assurances of the Federal Water Pollution Control Administration that treatment resulting in the limitations of loading to the levels stated below will enhance the quality and value of the water resources of the Potomac River and tributaries in the Washington Metropolitan Area, will meet State and Federal water quality standards, and will abate water pollution, make the following recommendations:

1. Based on the existing points of discharge, waste treatment facilities now discharging to the Potomac River between river mile 106 and river mile 91 shall be improved to achieve removal of BOD_5, total phosphorus and total nitrogen so as to limit loadings as follows:

	lbs/day		
Facility	BOD_5	Total P	Total N
Pentagon	300	20	145
Arlington	1,300	60	650
District of Columbia	12,700	560	6,130
Alexandria	1,300	60	630
Fairfax Westgate	900	40	445
	16,500	740	8,000

Additional loading and additional points of discharge will be acceptable only if the resultant water quality will be equal to or better than that which would result from adherence to the above load limits at the existing points of discharge. Flow augmentation from upstream reservoirs could alter the above load allocations.

Construction schedules for the foregoing plants are as follows:

District of Columbia Blue Plains:

Treatment Process	Start Design	Ready for Bid	Start Construction	Finish Construction
Primary & Excess Flow	5/1/69	3/1/70	7/1/70	7/1/72
Secondary (90% BOD removal)	12/1/69	12/1/70	4/1/71	4/1/74
Tertiary	12/1/69	7/1/71	11/1/71	1975-1977

Facility	Preliminary Completed	Final Plans	Commence Construction	Operational
Pentagon STP	4/1/70	4/1/71	8/1/71	8/1/73
Arlington, Va.	3/1/70	3/1/71	7/1/71	7/1/73
Alexandria, Va.	3/1/70	3/1/71	7/1/71	7/1/73
Fairfax Westgate	3/1/70	3/1/71	7/1/71	7/1/73

The treatment plants listed below shall provide 96 per cent BOD_5 removal, 96 per cent phosphorus removal, and 85 per cent total nitrogen removal, so long as they discharge their effluents to tributaries or embayments of the Potomac River.

Construction schedules are as follows:

Facility	Preliminary Completed	Final PLans	Commence Construc.	Opera-tional
Charles Co., Md. Mattawoman Creek	3/1/70	3/1/71	7/1/71	7/1/73
Fairfax County Dogue Creek	1/1/70	10/1/70	2/1/71	8/1/72
Little Hunting Creek	1/1/70	10/1/70	2/1/71	8/1/72
Accotink-Pohick	3/1/70	3/1/71	7/1/71	7/1/73
Andrews AFB*				
STP #1	3/1/70	3/1/71	7/1/71	7/1/73
STP #4	3/1/70	3/1/71	7/1/71	1/1/73
Piscataway	3/1/70	3/1/71	7/1/71	1/1/73
Fort Belvoir				
STP #1	3/1/70	3/1/71	7/1/71	1/1/73
STP #2	4/1/70	4/1/71	8/1/71	8/1/73
Naval Comm. Sta.*	1/1/70	10/1/70	2/1/71	3/1/72

* * *

It is recognized that the design and construction of facilities of this complexity may result in many technical and financial problems which may require modification of the above dates. These problems will be considered at the periodic progress meetings.

*These installations should, as an alternative, explore the possibility of connecting to other sewage systems serving their area.

2. Continuous and effective effluent disinfection shall be practiced at all sewage treatment plants to meet State and Federal Water Quality Standards.

3. The following industries shall comply with orders of the Maryland Department of Water Resources for completion of treatment facilities by January 1, 1970, to meet State and Federal Water Quality Standards:

Inland Materials Sand & Gravel, Clinton;
Receiving Waters: Tinkers Branch;

Potomac Sand & Gravel Corp., Greenway Flats;
Receiving Waters: Potomac River;

Silver Hill Sand & Gravel Co., Silver Hill;
Receiving Waters: Henson Creek;

A. H. Smith Sand & Gravel, Branchville;
Receiving Waters: Indian Creek;

Devlin Lumber & Supply Co., Rockville;
Receiving Waters: Crabs Branch;

Metropolitan Fuels Co., Bethesda;
Receiving Waters: Little Falls Branch;

Mineral Pigments Corp., Muirkirk;
Receiving Waters: Indian Creek;

Arundel Supply Co., District Heights;
Receiving Waters: Southwest Branch;

Banning Plymouth, Inc., Hyattsville;
Receiving Waters: Northeast Branch.

The District of Columbia, in cooperation with the FWPCA and the Potomac Electric Power Company will evaluate the effects of heated waters on the Potomac and Anacostia Rivers and report results together with recommendations for any required corrective actions to the conferees by January 1, 1970.

4. The Federal Water Pollution Control Administration, in cooperation with State, interstate, and local agencies, shall initiate detailed analyses of alternate methods of meeting future water quality requirements and sewerage needs in the Metropolitan Area. These analyses shall consider advances in waste treatment technology; space limitations which prevent unlimited expansion of the District of Columbia and other water pollution control plants; fail-safe sewer systems to prevent raw sewage discharges; possibilities for load transfers to other sewage treatment plants; opportunities for use of reclaimed water; sewers and alternate treatment plants and discharge points for treatment facilities and sludge disposal methods needed for the expanding Washington population. The study shall be completed by January 1, 1971, and a report and recommendations submitted to the Conferees.

5. The District of Columbia shall complete its Project C (a large interceptor sewer system) by 1971. The State of Maryland shall take action to control sewage overflows from sources in Maryland. Alexandria shall complete plans by December 31, 1971 for elimination of pollution from combined sewer overflows.

The Conferees recognize that desired water quality of the Potomac cannot be assured on a year-round basis until the discharges from combined sewers are controlled. This is a very complex problem which probably will require the expenditure of considerable sums to correct. The Conferees, at six-month intervals, shall review plans for elimination of pollution from this source and establish a timetable for the control of pollution from storm water overflows.

6. The planned advanced waste treatment plant at Piscataway shall be constructed as soon as possible.

7. The appropriate State, county, and municipal agencies shall take action to prevent and correct pollution from septic tanks and raw discharges in the counties of the conference area and report progress to the conferees at six-month intervals.

8. The appropriate regulatory agencies

in the Conference area and the District of Columbia shall adopt and enforce effective ordinances for the control of soil erosion. The Interstate Commission on the Potomac River Basin is requested to continue its active program for the control of soil erosion.

9. The Secretary of the Interior is asked to request the Secretary of the Army to have the Corps of Engineers (a) install and maintain devices for the purpose of preventing debris from washing into the estuary, and (b) report to the Conferees concerning the adequacy of its debris sweeping operations.

10. The FWPCA shall establish a committee comprised of representatives of the Federal and State regulatory agencies to: (a) conduct a joint survey of oil storage areas, terminals, and oil pollution from vessels and (b) recommend to the Conferees by November 1970 actions required to minimize the possibility of pollution by oil and other petroleum products.

11. The National Park Service is to provide areawide leadership for a program designed to keep the shores of the Potomac and its tributaries free of debris and litter. Elements of this program should include:

--a continuing program for the cleanup of shoreline debris and litter.

--a review of State and local park agencies' operating procedures with a view to modifications which will minimize the amount of debris and litter which may enter the Potomac and its tributaries.

--a public information program to obtain maximum citizen participation.

--appropriate coordination with the Corps of Engineers.

The National Park Service is requested to report to the Conferees on the established and continuing progress of the areawide program at each scheduled public progress meeting.

12. The Federal Water Pollution Control Administration in cooperation with the States of Maryland, Virginia, the District of Columbia, and the Interstate Commission on the Potomac River Basin, shall coordinate surveillance programs including stream monitoring, effectiveness of waste treatment plant operations, and of sediment control programs.

13. The States should develop uniform regulations for controlling pollution from watercraft

unless enactment of Federal law makes this unnecessary.

14. The Interstate Commission on the Potomac River Basin, the States of Maryland, Virginia, Pennsylvania, and West Virginia, the District of Columbia, and the Federal Water Pollution Control Administration, shall make a joint study of the entire Potomac Basin to determine what controls will be required to protect the river and the estuary, and to secure compliance with State and Federal Water Quality Standards. The Conferees emphasize that protection of water quality in river and estuary requires the continuing cooperation of all basin communities, landowners, and official agencies.

The Interstate Commission on the Potomac River Basin is requested to call a meeting to consider the entire basin water quality problem with specific emphasis on problems of nutrients, bacteria, sediments and pesticides.

15. Public progress meetings shall be held in May and November of each year.

(Whereupon, at 5:45 p.m., the Conference was concluded.)

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